

# HP Professional

THE INDEPENDENT MAGAZINE FOR NEWWAVE COMPUTING ▲ VOL.6 NO.5

MAY 1992 ▲

NEW WAVE

## Object Orientation

- ▶ HP's OpenODB Paves New Avenues For Data Access
- ▶ Hybrid Tools — Combining OOP With Expert Systems
- ▶ OOP Is More Than A Good Idea ... It's The Law
- ▶ Industry Watch: HP's Effort To PROpel PA-RISC





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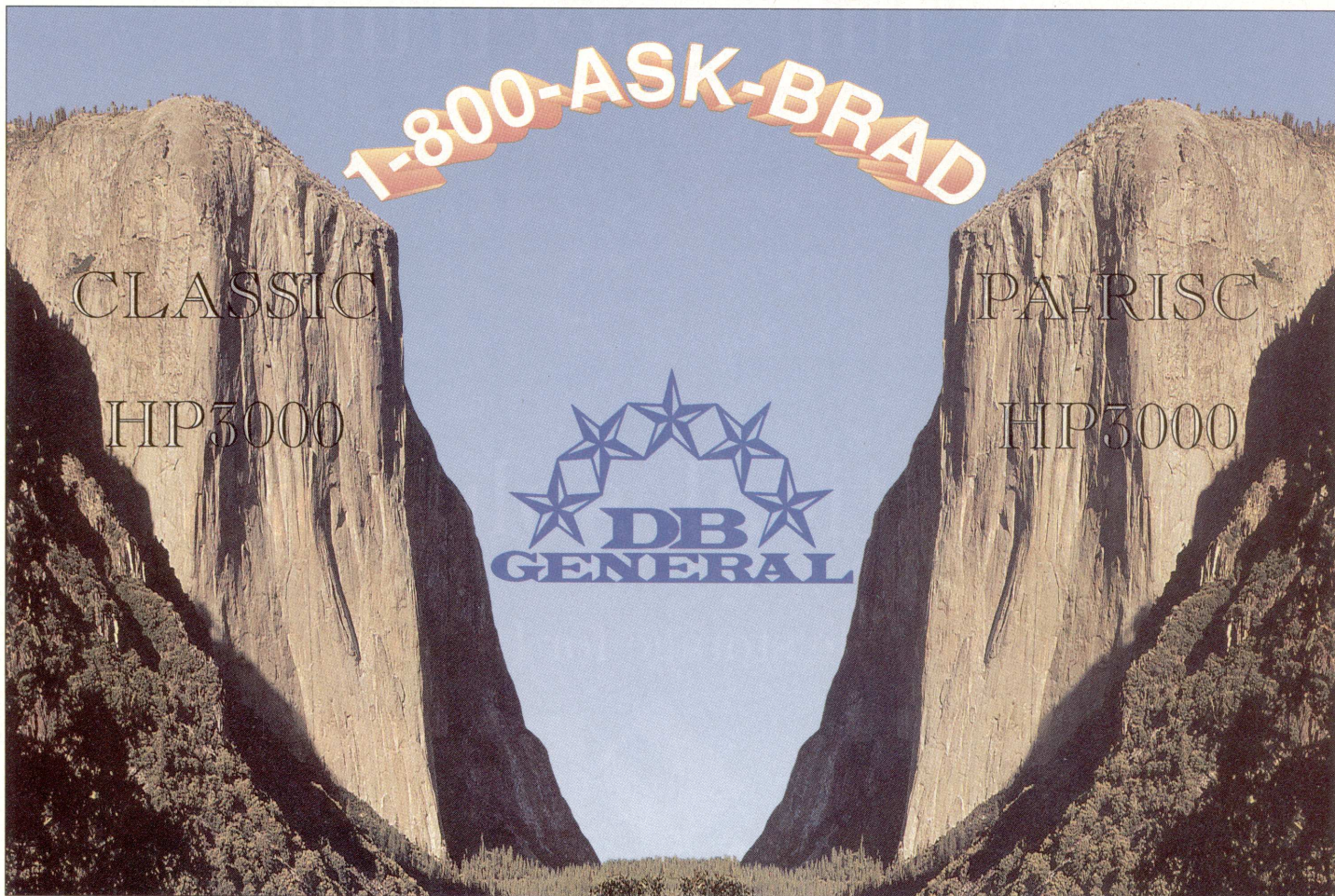
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MAY 1992

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## 26 ▶ **OpenODB**

*By Bill Sharp*

HP's object-oriented database technology, OpenODB, facilitates access to different systems and data types, while providing enhanced security and authorization barriers. Overall, it's an easier, faster way to reach far flung, disparate data.

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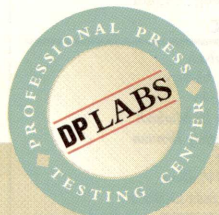
*By Ross G. Hopmans*

By combining object-oriented programming, expert systems and graphical front ends, hybrid tools create a dynamic software development environment. Implementing these technologies will help reduce development time, lessen the maintenance effort, and increase effectiveness of the application.

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*By Gordon McLachlan*

The increasingly popular issues of object-oriented design and programming bring up thorny technical and philosophical questions. An esteemed expert reveals that object orientation isn't just a good idea — it's the law.



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by Eric Fowler, Trenton, NJ

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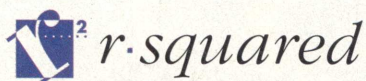
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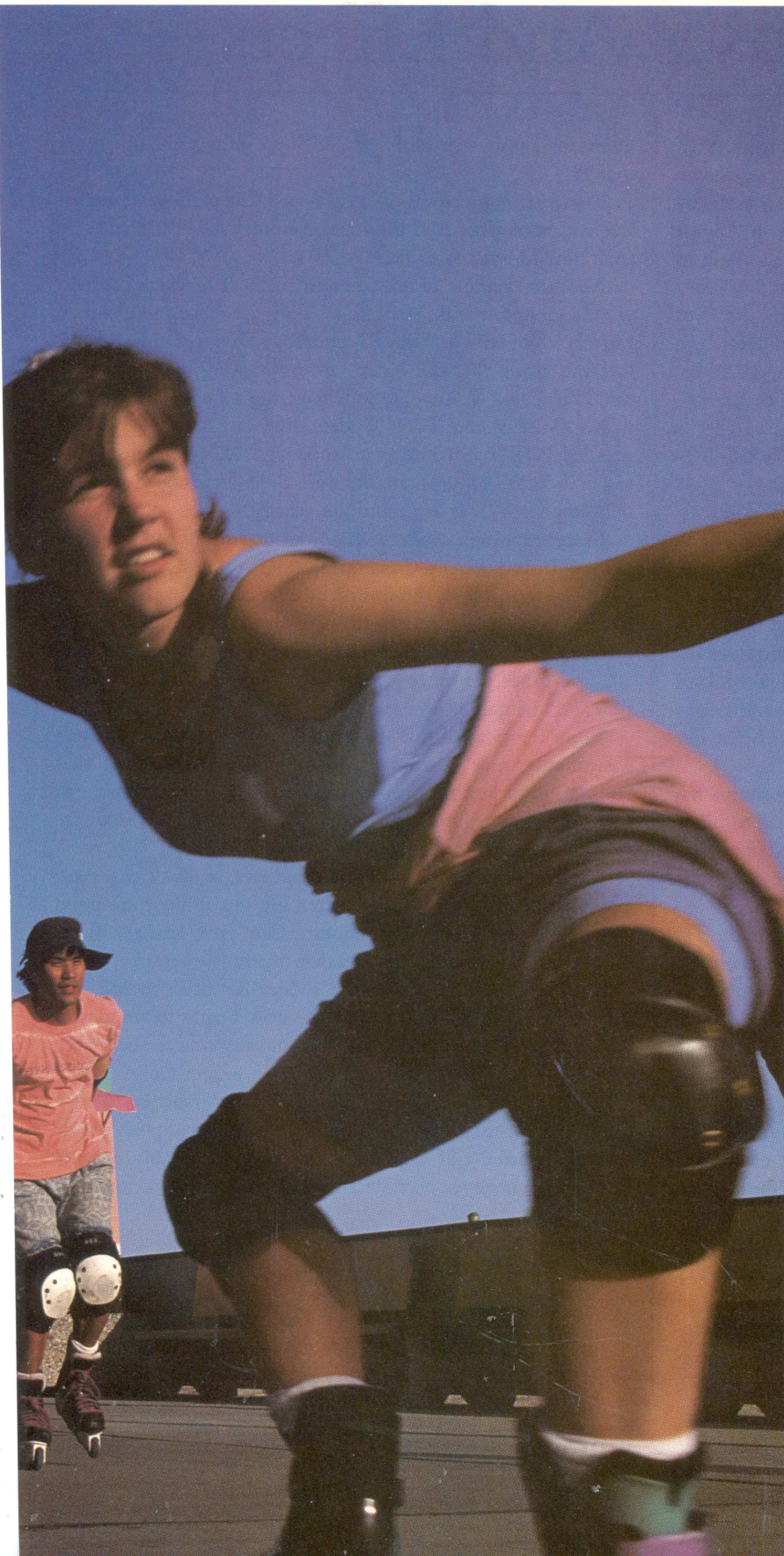


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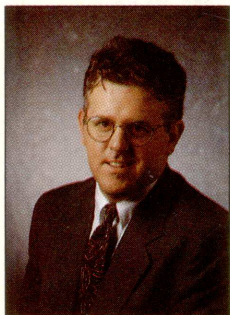
## Think again.



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# Common Causes And Effects



By Grant Evans

• • •

I'm just about finished sifting through the landslide of paper that accompanied me home from the March ICMS in Atlanta. I think I'll be smart in August and bring a few Fedex labels along to New Orleans to avoid the possibility of spending Labor Day with a tube of a pain remedy endorsed by some hobbled gridiron star of the '60s.

The ICMS provided a great opportunity for me to tag some real people to those voices and names which pre-

viously were attached only to telephone earpieces or press releases. And because it was my first HP-specific show and conference, I spent the majority of the three days meeting with vendors and HP folks. If the show had been three days longer, I could've accomplished everything I wanted to.

Rather than running off a list of what we did and didn't see in Atlanta, I'd like to focus on the concept of responsiveness — it's one intangible that distinguishes the Hewlett-Packard market from the others I have watched. In the six months since I migrated here from the IBM side, this *responsiveness* has become evident in a variety of situations.

Of course, HP's proactive approach to media relations has been a welcome change after three years of covering the IBM market through a blue veil of reticence. Until the Atlanta conference, however, I wasn't fully aware of the nature of the interaction between HP and its installed base.

Perhaps the best example of this relationship was the HP Open Forum held one evening at the ICMS. Because questions for the panel were being collected for the two days prior to the actual session, I assumed that a moderator would read them to the assembled HP brass who would then read their prepared (read: rehearsed) responses.

So much for that assumption.

During the two-hour session, the questions were read by the moderator, and then directed to one of the HP executives onstage. Two microphones stood in the aisles of the auditorium, and the assembled users put them to good use — posing their own specific questions of the HP group (and usually a follow-up or two). Some of the best questions were those that were not submitted beforehand.

The users and vendors took full advantage of the opportunity. Some chided HP for what they perceived as areas of unresponsiveness or excessive red tape. Some had very specific

questions about sales and service. Some just stood up to say thanks.

The level of give-and-take exhibited that night was impressive and reassuring. And the HP representatives sitting up there took note of what was said.

Another example of this responsiveness came one afternoon when I sat down with Mark Solle, Tony Engberg and Deborah Nelson, all of HP's Software Technology Division in Roseville, CA (the group that Bill Sharp wrote about in his April article titled "Keeping V Alive"). Solle gave me a condensed version of his "MPE V and Tools Update" session, during which he stated that HP will continue to support MPE V as long as customers require support. In addition, Solle announced that HP will support RTE at least until the year 2010.

More important, Solle pointed out that six of the top eight System Improvement Committee (SIC) requests for MPE V would be available in the second quarter of 1992 as part of Release 23 of MPE V (this month) or Release 2P (coming in December). Solle pledged that HP will continue to work with the SIC and other customer groups to preserve customer satisfaction and maintain the value of their products.

Tony Furnival of the SIC summed up the impact of these customer groups when he told me that "Users know that HP's going to listen." I can think of no better endorsement of user advocacy groups such as the SIC — or of HP's response to their requests.

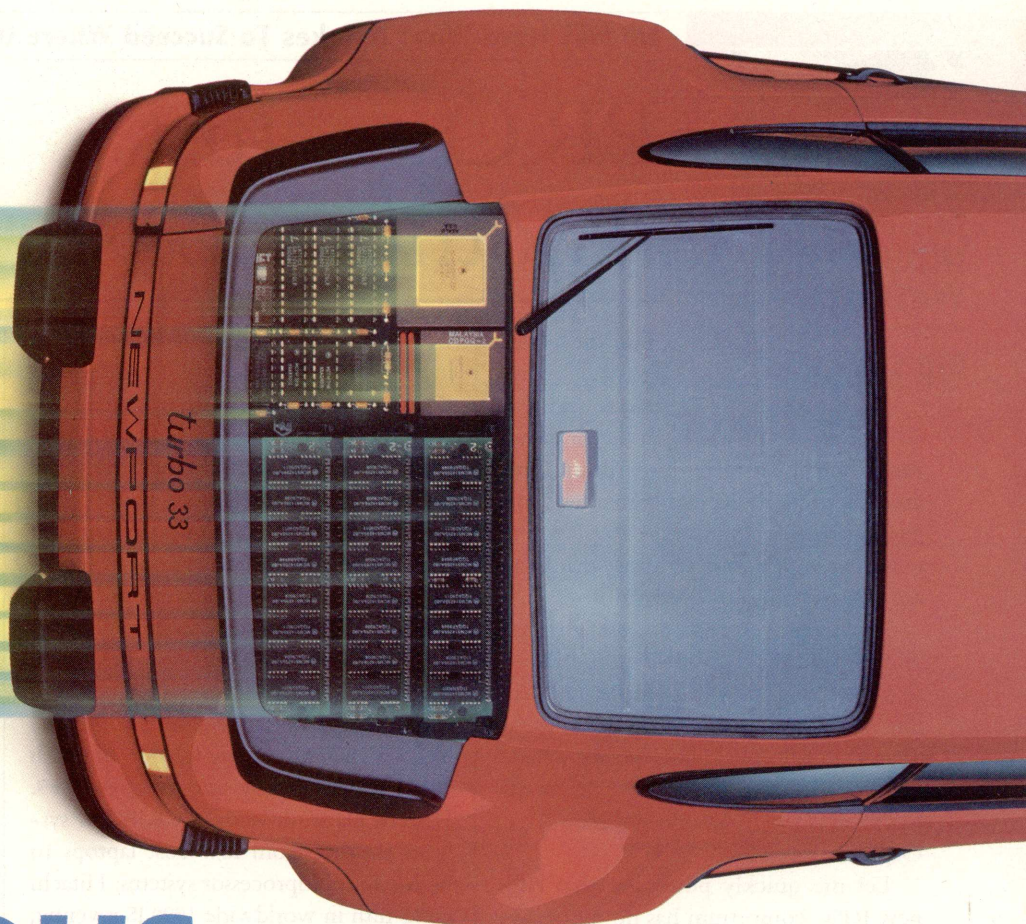
There's an old adage in business that says, in effect, that once a company grows very large, it often loses its ability to respond to its customers' needs and requests. One great analogy likens the process to changing the direction of a full-laden supertanker on the open ocean — after the rudder has been turned, the ship can travel a full mile before the bow begins to respond. I can think of a few instances in this industry where such a response gap has led to loss of market share — and worse.

In HP's case, the distance is reduced considerably by the opportunities for users to speak their peace and the company's willingness to listen and respond. As users, we can only provide our input whenever possible and trust that it will continue to be heard.

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## INDUSTRY WATCH

Bill Sharp

Yes, the world turns, time passes, spring is in the air, flowers bloom, bees buzz, birds bring forth little cheeping babies and computer companies create a confusing cacophony of consortia — it's good to know that there are constants in our silly world.

HP announced recently just what everybody knew they would announce — that they want to sell more PA-RISC to lots of people, and some companies far from Palo Alto are willing to take a hand in making that happen. HP calls its effort to sell more RISC the Precision RISC Organization (PRO).

Let me quickly point out that HP's new RISC consortium has no monetary, philosophic or other affiliation whatsoever with a certain magazine sometimes called *HP Pro*. No siree. The real PRO is one of the myriad of computer consortia formed over the past several years by various groups of computer vendors trying to get some kind of a competitive edge over their rivals. I tried to get an accurate count of current consortia, but ran out of numbers. For a reasonable graphic representation of this phenomenon, stand outside on a clear night and look up.

### The Facts

The news is this: On March 24, HP's Wim Roelandts and executives of nine other firms stood up in a presentation at The Equitable Center on Seventh Avenue in New York City and said the kinds of things that executives always say about one another when they stand up and say things in New York.

Here are the firms:

■ Hewlett-Packard, Palo Alto, CA — The maker of PA-RISC based products

with a broader range than anybody else in the computer business. PA-RISC has produced 75 percent performance increase every year, with a total 1,000 percent increase in performance since the technology was introduced in 1986, according to HP. HP ranks seventh in worldwide information systems (IS) revenue based on 1990 data, according to Datamation magazine (other rankings below are also per Datamation 1990 data).

■ Hitachi Ltd., Tokyo — This is a very large company with IS efforts in several markets and an ongoing relationship with HP that was already underway in 1989. Hitachi plans on using PA-RISC in systems ranging from low-cost laptops to high-end multiprocessor systems. Hitachi ranks fifth in worldwide 1990 IS revenue, which makes them larger than HP.



■ Mitsubishi Electric Corp. (MELCO), Tokyo — Mitsubishi develops and markets electronic and electrical systems in several markets. It will purchase more than 10,000 PA-RISC workstations and servers for use with its systems. MELCO ranks 28 in worldwide 1990 IS revenue.

■ Oki Electric Industry Ltd., Tokyo — Oki plans to use PA-RISC in telecommunications, automotive and factory automation systems, as well as for embedded controllers. Oki ranks 29 in worldwide 1990 IS revenue.

■ Yokogawa Electric Corp., Tokyo — Yokogawa will use PA-RISC chips as embedded controllers in its process-control products for the oil, petrochemical, chemical and steel industries.

In addition to Team Tokyo, HP signed on U.S. firms including:

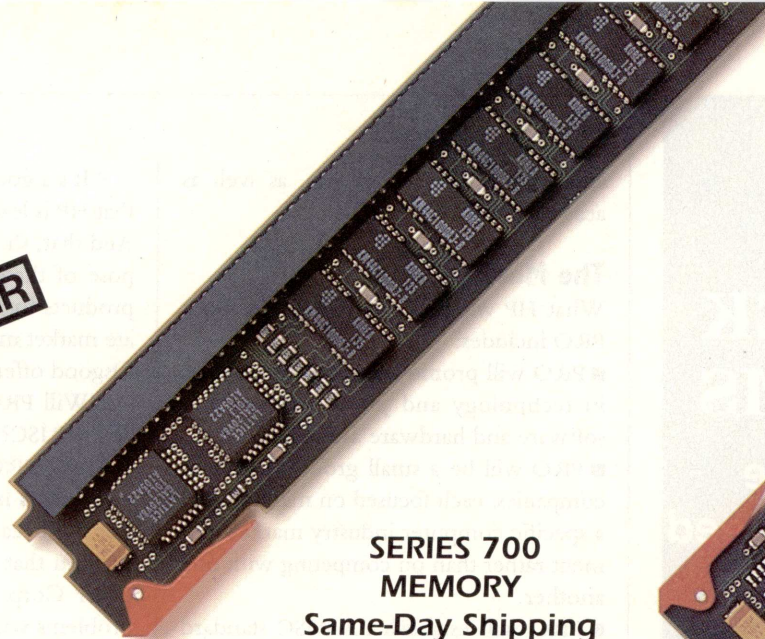
■ Prime Computer Inc., Framingham, MA — Prime will resell PA-RISC business servers worldwide, along with its PICK-compatible data management software. Prime ranks 41 in worldwide 1990 IS revenue.

■ Convex Computer Corp., Richardson, TX — Supercomputer maker Convex plans to use PA-RISC in massively parallel systems. Convex ranks 92nd on Datamation's list of the 100 largest IS companies in North America.

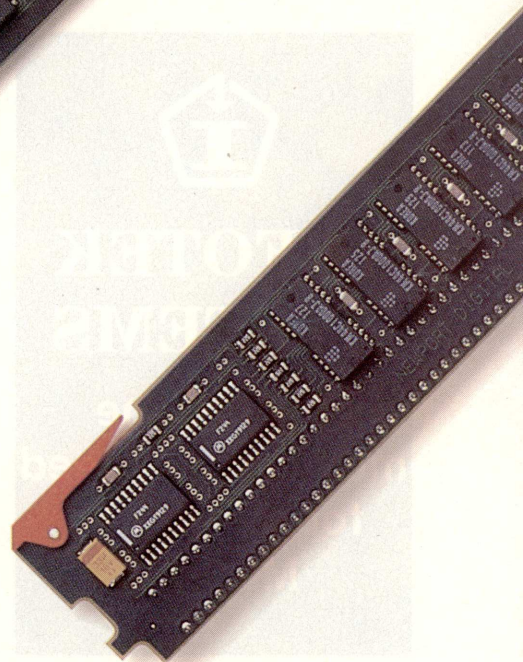
■ Hughes Aircraft Co., Westchester, CA — Hughes will use the chips in its lines of automotive and defense electronics, air-traffic control, and satellite communications products.

■ Sequoia Systems Inc., Marlborough, MA — Sequoia is working closely with HP on development of new fault-tolerant computers based on PA-RISC. Together, says HP, the nine firms account for electronics-related revenues greater than \$61 billion. HP expects more members to join PRO, including database





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and applications developers, as well as academia and end users.

### The Message

What HP wants to communicate about PRO includes:

- PRO will promote continual advances in technology and price/performance, software and hardware availability.

- PRO will be a small group of leading companies, each focused on marketing in a specific computer industry market segment rather than on competing with one another.

- PRO will establish PA-RISC standard hardware and software interfaces to make applications portable. This, says HP, will allow creation of "shrink-wrapped" software for the market.

- Memberships range from sponsor at \$100,000, to senior at \$10,000, General at \$1,000 and Associate at \$100. Professional staffing for PRO will be small.

- PRO will provide administrative and marketing functions, as well as PRO standard verification and certification. Members get varying degrees of technology access depending on the membership level. Members can propose changes to the PA-RISC architecture and standards.

All this is what HP and its fellow vendors said in New York. And like most such gatherings dominated by important persons, the occasion was not marked by dynamism or spontaneity, but by a kind of careful and cautious choreography — a ballet of the biggies.

### The Analysis

What most people say in response to most such gatherings, whether they are done by the ACE consortium, by the SPARC gang or by HP's PRO, is a soundless opening of the mouth often referred to as a yawn and generally accompanied by sleepy-sounding noises.

But let's wake up and take a closer look at PRO. Carolyn Osgood, senior analyst with International Data Corp. says simply that there is no reason to expect HP's consortium to be any different in its affect than any other of the similar computer industry consortia — and that's not necessarily bad.

"It's a good sign," she says. "It shows that HP is learning how to merchandise." And that, she reminds us, is the real purpose of these consortia — to sell more products by banding together to generate market momentum and market share. Osgood offers more:

"Will PRO expand the market share of PA-RISC?" — *Yes.*

"Will PRO wipe out ACE?" *Definitely not.* ACE is in serious trouble, she notes, but not because of PRO. ACE, the consortium that includes DEC, MIPS Computer Corp. and others, has plenty of problems within its own ranks.

Osgood says the industry is focusing too much on consortia and the posturing that goes with them. The industry would be better off focusing on "bringing products to market on a timely basis. The true test is the quality and timeliness of new products."

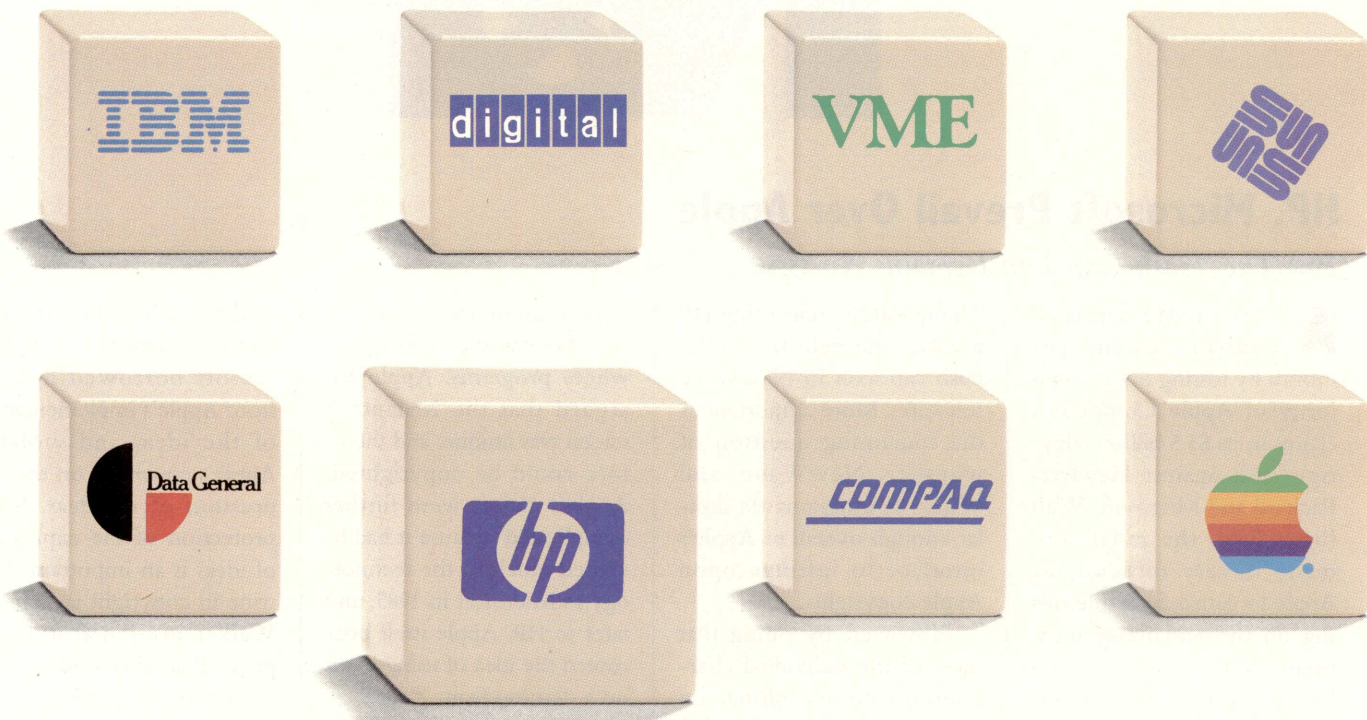
Ultimately, HP and its competitors will be held accountable by customers who will use Osgood's measure and vote with their wallets. And in the meantime, HP will seek to gather the best team it can to help one another deliver those high-quality, timely products. We can expect to see one or more European firms added to the ranks of PRO members, as well as a PC vendor or two to round out the low end of the pack. HP missed in its bid to bring Groupe Bull of Paris into the fold, and so must seek alliance with others.

In HP's favor is the luster of current success that has driven up the price of company stock and has folks buying workstations and HP 9000 minis in impressive numbers. Tucked away in a corner of HP's announcement of PRO was an assertion that PRO is "structured for long-term relationships, with procedures for evolving architecture and standards in a systematic, well-managed manner." Without a doubt, other consortia were set up with precisely the same things in mind, but in fact nobody has performed well in this regard. HP and PRO may have the qualities to carry this off — if so, it will be a first. But as Osgood says, the proof is in the products. ■



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## HP, Microsoft Prevail Over Apple

*But The Trash Can Icon Remains An Issue*

A federal judge surprised industry pundits last month by tossing out the majority of Apple Computer's claims in its \$5.5 billion copyright suit against Hewlett-Packard and Microsoft. With the ruling, the judge also made it very difficult for Apple to gain a favorable ruling on the remaining arguments. The case has been widely regarded as the single most important piece of litigation in the desktop computing market.

The 1988 suit argued that HP's NewWave and Microsoft's Windows illegally infringed upon copyrights for Apple's popular Macintosh user interface. Apple claimed copyright protection for such basic characteristics as overlapping windows and movable icons, which it claimed were used illegally by Microsoft. Similarly, Apple's contention that HP NewWave infringed on copyrighted Macintosh characteristics was rejected.

U.S. District Judge Vaughn Walker did not rule on several questions which he left open for another hearing scheduled for this month.

The question concerning HP involves the right to use the trash can icon in NewWave software. More important is the remaining question of whether NewWave and Windows programs are similar enough overall to Apple's interface to infringe upon Apple copyrights.

However, by ruling that most of the individual characteristics do not infringe on copyrights, Judge Walker left little room for Apple attor-

neys to argue that Windows and NewWave infringe as whole programs. Apple has argued that the Macintosh screen was unique, and therefore could be copyrighted. Apple's claims were further complicated because it had licensed much of the technology to Microsoft in 1985, and later to HP. Apple itself borrowed the idea of using icons on a desktop from Xerox.

Apple did not claim that Microsoft and HP stole the

desktop idea, but instead claimed that HP and Microsoft borrowed heavily from Apple's implementation of the idea, and violated Apple's copyright on the expression of its ideas. Such protection of the expression of ideas is an important doctrine in copyright law. Judge Walker insisted that Apple prove that Microsoft and HP copied specific portions of the Apple interface.

In filing the suit, Apple sought lost profits from the decreased selling prices of Apple products which the company attributes to the presence of Microsoft Windows. In March, Apple increased the amount it sought in copyright infringement damages by more than \$1 billion.

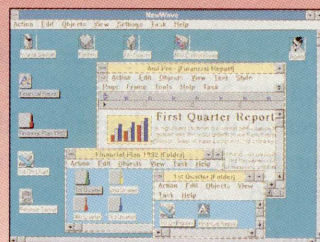
News of the ruling propelled Microsoft stock by more than \$11 a share on the New York Stock Exchange, lining the pockets of company chairman Bill Gates with an additional \$600 million. HP's common stock rose more than \$2 a share following the ruling. — *Grant Evans, Managing Editor*

## NewWave 4.0 Ships

HP has announced and begun shipping HP NewWave 4.0 Desktop Manager software for Microsoft Windows.

Among the improvements to the major upgrade from Version 3.0 are drag-and-drop printing, 32-character data file titles, and drag-and-drop attachment of Windows documents to the NewWave desktop. All DOS and Windows applications are now interoperable with the NewWave desktop manager.

The NewWave Agent now offers better control of DOS and Windows applications in addition to increased power as a general-purpose macro facility. In addition, NewWave now supports applications supporting Microsoft's object linking and embedding (OLE 1.0) API. HP NewWave Desktop Manager is available now for \$195.





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## Deals Spring Forth

### *Mega-Deals Provide HP With Feet In A Few Important Doors*

It's been a decidedly sunny Spring for the folks in Palo Alto, as HP landed a number of major contracts for PA-RISC systems.

In March, HP landed a \$100 million deal to supply workstations to GTE Telephone Operations. Shortly thereafter, GE Aircraft inked a \$10.6 million pact for HP workstations and related services. On April 7, HP won a whopping \$100 million workstation contract from a division of Hughes Aircraft. Just a day after the Hughes deal came word of a broad-based pact with Oki Electric through which Oki will purchase \$80 million worth of PA-RISC systems and peripherals over the next three years.

The deal with Oki is more than a sizeable computer purchase; it paves a critical new distribution avenue for HP products in Japan and increases the acceptance of HP-UX products in that market. Oki has agreed to add HP 9000 Series 800 Business Servers, Series 700 workstations and the HP-UX operating system to its systems integration business offerings. These systems will be sold for use in banking, hotel automation, facilities management and local government applications.

In addition, Oki stated its intention to license hardware and software development tools from HP, and the two companies will jointly develop and integrate computer and telecommunications solutions. Oki already licenses

PA-RISC technology for use in its embedded controllers.

Just a week after the announcement of the HP-Oki alliance, Oki and Hitachi announced that they will jointly develop RISC chips based on the PA-RISC architecture for use in embedded controller applications such as high-speed printers and automotive electronics.

Meanwhile on the domestic front, HP has made inroads as a workstation supplier to the federal marketplace.

Under terms of last month's contract with Hughes Data Systems, a division of Hughes Aircraft, HP will supply Hughes with up to 4,300 Series 700 workstations and servers over the next four years. Hughes, in

turn, will ruggedize the workstations and provide them to the U.S. Navy under a defense award. The workstations will be installed in combat ships, submarines and some land-based facilities for both office automation and tactical applications as part of the Navy's TAC 3 program. — *Grant Evans, Managing Editor*

## HP Offers CISC-To-RISC Upgrade

### *Kit Transforms Series 400 To Model 710*

**A**s part of its Open Migration Program, HP recently introduced a performance upgrade option that allows HP Apollo Series 400 workstation customers to boost the performance of their systems into the Series 700 range. The upgrade kits ranging from \$6,000 to \$8,000, will provide users with the ability to increase the performance and lengthen the lifespan of their installed CISC-based HP-UX and Domain workstations.

The initial upgrade kit will enable users of the Motorola 68000-based Series 400 Model 425e to upgrade to a Series 700 Model 710. In addition to delivering a four-fold performance increase, the 425e-to-710 upgrade allows software written for the 710 to run on the upgraded workstation without modification.

According to HP, the CISC-to-PA-RISC upgrade program will embrace Apollo Domain workstations as well. In early 1993, HP expects to

deliver upgrades for Series 400 Models 400dl, 400t/s, 425t/s and 433s to Series 700 models. HP says that additional details of the program will be made available in the third quarter of this year.

According to HP, the Domain-to-700 upgrade kits will include the HP-UX operating system in addition to the board included in the straight CISC-to-PA-RISC upgrade kits.

In addition, HP announced new interoperability and migration tools to improve communications capabilities among its workstations. The tools — DMX, HP Visual User Environment (VUE) and the Apollo Token Ring (ATR) card — are designed to help users of Domain/OS-based Series 400 and Apollo DN workstations to integrate HP-UX-based Series 700 workstations into their networks.

DMX is a windowing and editing environment based on the original Domain/OS Dis-

play Manager. HP says that when it becomes available on HP-UX and Domain/OS next month, it will provide a familiar environment for those Domain/OS customers making the move to the Series 700. With HP VUE on Domain/OS, users of Series 400 and 700 workstation on a network can use the same GUI.

The ATR card, which began shipping for Models 720, 730 and 750 workstations in March, will be made available for Series 400 workstations that are upgraded to Series 700. The ATR card enables users to add HP-UX workstations to their existing ATR networks.

A migration toolkit for Domain/OS-based system is scheduled for availability next month. HP says the kit will include a source-scanning tool which will enable customers to port Domain/OS C and FORTRAN programs to standards-based code.



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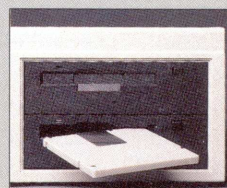


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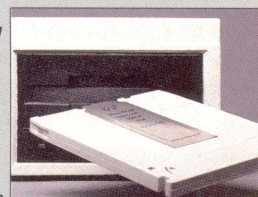


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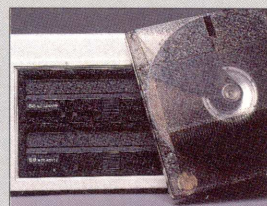


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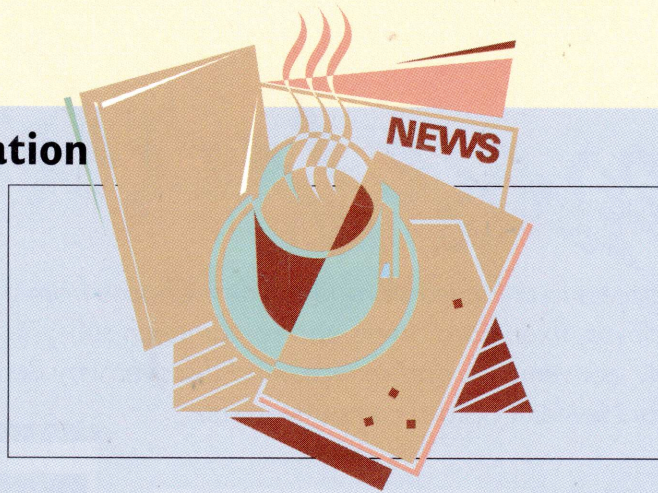
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■ Hewlett-Packard is offering a Hands-On With Open Client-Server Technologies workshop. Topics addressed include GUIs, system interoperability, application interoperability and network management. For more information call (800)-HPCLASS.

■ PeopleSoft announced its client-server PS/HRMS on HP ALLBASE/SQL from HP and on Oracle Corp.'s ORACLE relational database management systems. PS/HRMS is a client-server, Windows-based human resource management system for the Fortune 1,000 marketplace. It consists of five fully integrated products PS/Human Resources, PS/Benefits, PS/Flex, PS/Payroll and PS/PayLink. (415) 579-6620

■ A new computer workstation division has been formed at HP's Fort Collins site. The Entry Systems Division (ESD) will develop and deliver low-cost workstations and mobile workstation. The current Workstation Business Unit in Fort Collins, CO will form the basis of ESD. (303) 229-3235.

■ Hewlett-Packard announced that Alsys Inc. will be responsible for the development, marketing and support of the HP Ada compilation systems and related toolsets operating on HP workstations and business systems. Alsys is a Ada supplier offering Ada compilation systems across a broad range of HP platforms including the HP Apollo 9000 Series 700 and 400 workstations, and HP 9000 Series 300 workstations

and series 800 business systems and servers.

■ Cognos is now shipping its PowerDesigner analysis and design tool. PowerDesigner, which runs on Intel 386 systems under OS/2 Presentation Manager, aids in the analysis and design of PowerHouse applications running on a variety of UNIX and proprietary systems from HP, DEC, IBM, Data General and Sun. (617) 229-6600.

■ Unison Software announced an enhancement to SpoolMate to support printing HP 3000 spoolfiles directly to LaserJet printers attached to a LAN via a TCP/IP interface, such as HP's new JetDirect Card. The JetDirect Card allows HP peripherals to be connected to an Ethernet network and offers support for printing for HP-UX systems. (408) 245-3000.

■ ISICAD signed an agreement with Ricoh subsidiary, MTI, to bring ISICAD's Physical Network Management systems to Japanese information technology management. MTI will offer COMMAND 2000, ISICAD's PC-based physical Network Management software coupled with Ricoh's PCs. MTI also will market ISICAD's UNIX-based Physical Network Management

solution COMMAND 5000 on HP platforms. (714) 533-8910.

■ Wolfram Research will host two Mathematica Conferences. One will be held May 27 to May 31 at the Swiss-hotel Boston-Lafayette Hotel in Boston, MA. The other will be held Sept. 2 to Sept. 5, at the Beurs-World Trade Center in Rotterdam, The Netherlands. (415) 585-8113.

■ Workstation Solutions entered the UNIX market with the introduction of Quick Restore. Quick Restore is a network backup and restore program. It uses a client-server model plus a special device driver that exploits the direct-to-block positioning capability of Exabyte tape drives. (603) 880-0080.

■ Hewlett-Packard and Intel Corp. announced a technology agreement under which the companies will develop a chip set designed specifically for the HP 700/RX family of I960 RISC processor-based X stations. The resulting integrated-circuit devices will be used with Intel's I960 CX series of superscalar microprocessors to provide chip-set solutions for X-station applications. (508) 436-5017.

■ Infotek Systems, announced new additions to its family of products — memory upgrades for the new HP Apollo

Series 700, Model 705 and Model 710. The memory modules named EM705 and EM710 are available in 16- and 32-MB capacity sets. (303) 879-1184.

■ Pilot Software announced the establishment of a wholly-owned subsidiary in Stockholm, Sweden. Called Pilot Software AB, the subsidiary will provide full sales, support and service in Sweden for Pilot's line of executive information systems (EISs), decision support systems (DSSs) and information access. (617) 350-7035.

■ Software AG announced the availability of UNIX versions of its core products — Natural, Adabas and Network. Natural is a fourth generation application development system. Adabas is a relational database. Network provides transparent communication between processing environments to route and exchange information between users. These products are available for HP-UX, Ultrix, AIX and other UNIX-based operating systems. (703) 391-6727.

■ Computer Solutions Inc. announced the availability of disaster recovery services for HP-UX users on the HP 9000 Series 8000 minicomputer. Computer Solutions will cover HP-UX subscribers with a newly installed HP 9000 Series 850S and additional systems will be installed as demand warrants. A total of 15 HP 3000 minicomputers are maintained in two hot sites facilities to serve current subscribers running MPE V and XL. (201) 672-6000.



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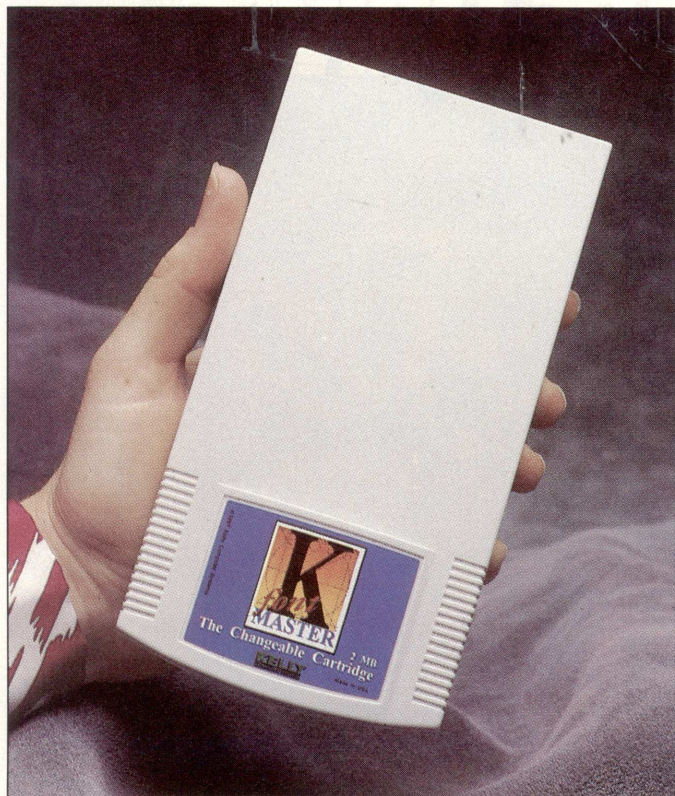
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To use FontMaster you need a system running MS-DOS or PC DOS 3.1 or later, an IBM PC compatible with at least 512 KB, a hard disk with at least 5.5 MB of free disk space and one 5 1/4-inch disk drive and a HP LaserJet printer II, IIP, IIP+, IID, III, IIIP, IIID, IIISi or compatible. FontMaster supports any printer that supports Series II cartridge formats. It comes in 1 and 2 MB capacities. Prices are \$449 and \$599 respectively. The Font Cartridge Parallel Programmer cost \$799. — *Andrea Zavod, Associate Editor*

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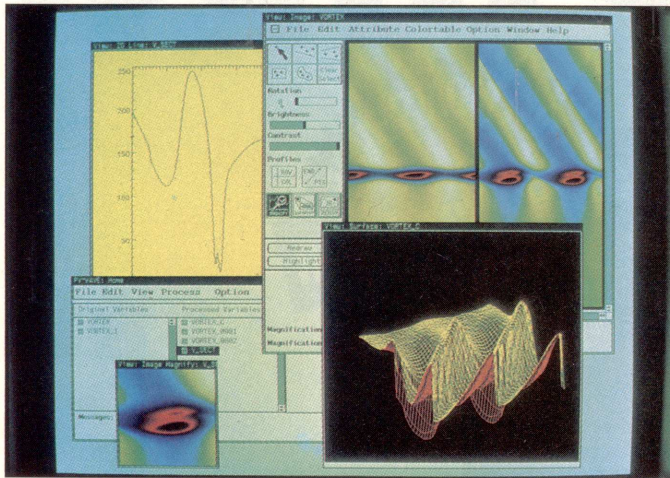
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Designed for use on HP Apollo 9000 Series 700 workstations, Point & Click Motif lets analytically-oriented people like engineers, scientists, and researchers use their workstations to collect, explore and alter data visually.

The Point & Click main courses include synchronized tables and graphics, data import and previewer, 2-D and 3-D display, image processing

and visualization, ASCII file handling and macro functions. Point & Click interfaces to your workstation via a mouse letting you pull down menus, icons and dialog boxes. You also can import and export data files, as well as cut, copy and paste graphics.

The dimensional control lets you scale graphs using log of linear axis and annotate graphs with text, lines and markers. You can change data in one view to be updated in all views. You also can select a section of one view to be highlighted in every other view it appears. Selected regions of views can be rotated, cropped and rescaled, or shaded with Gouraud or evaluation techniques. You control color tables using RGB, HSV and HLS modules.

While philosophers and scientists argue over the Fourth dimension, Point & Click lets you drape an image or superimpose a variable on a 3-D surface, and then animate 2-D and 3-D images to see another dimension.

Point & Click isn't limited to full course banquet analysis. It also allows ad hoc projects for those times you're feeling a little data peckish. For example, data reduction and analysis features let you calculate math and statistical functions like exponentials, transcendentials, mean, standard deviation and correlation.

Bessel, Gamma and Gaussian probability are supported, along with standard

error functions. You filter data through relational and Boolean operations and can perform matrix and array functions, and Hilbert and Fourier transforms. In 2-D image processing you convolve two vectors or arrays, or convolve an image with a kernel you define; along with smoothing images using box car, and median algorithms.

An ASCII file handler lets you preview ASCII files of unknown format, define fields to be imported, filter out characters, and map missing data strings into values. The supported input/output data includes ASCII free files, TIFF, 8 and 24 bit image files, binary files, UNIX XDR files, PV-WAVE save files and Sun raster files.

Point & Click Motif applications range from test engineering and medical imaging to space exploration and Earth sciences, including the study of geodynamics in satellites, analysis of thermal dynamics and interpretation of seismic data.

Point & Click Motif for the HP platform costs \$4,500 for a single floating license, with varying prices for multi-user configurations. So now, you don't have to be a chef du program to create presentation feasts. Bon Appetite. — Charlie Simpson, Technical Editor

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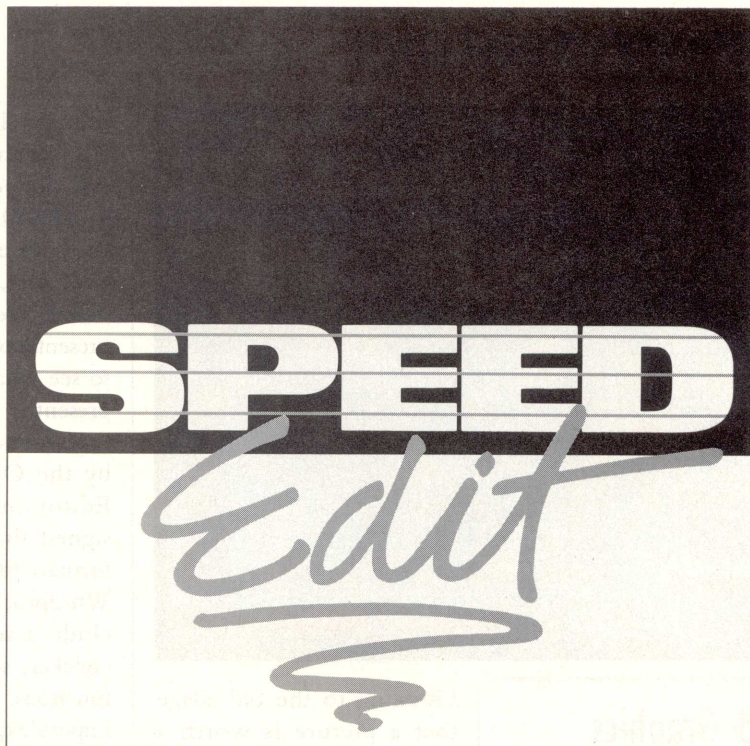


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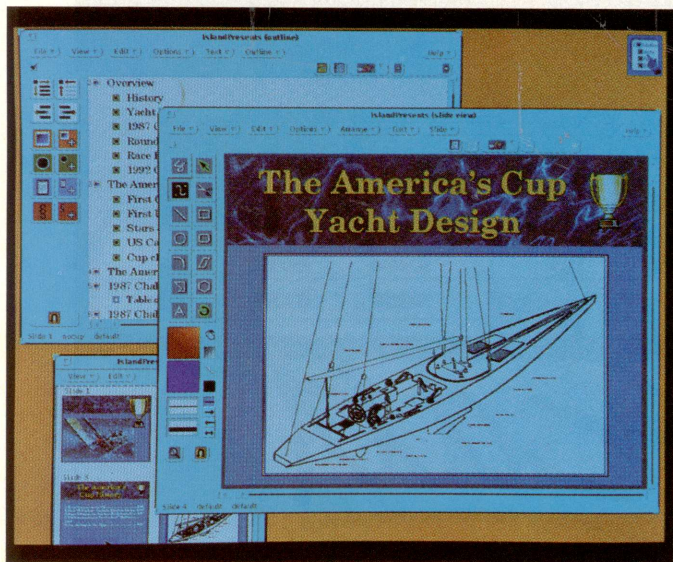
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### Island Graphics Adds Business Graphics Software To Its Proven Desktop Publishing Product Line

Listening to the old adage that a picture is worth a thousand words, Island Graphics Corp. (San Rafael, CA) introduced IslandPresents, a complete business and presentation graphics package.

Three modules comprise the IslandPresents family.

The main module includes the Outliner, Slide Editor and Organizer. These three main module components help you progress from concept to slides. The Outliner provides items for defining the contents of your presentation, including items for each slide, the presentation's body, annotations and sections. Pieces of your presentation can be cut, moved and reorganized as you go. Slides are generated automatically from the Outliner.

The Slide Editor includes a custom tool palette to enhance existing slides or to create new ones. Changes

made to slides are automatically reflected in the Outliner and vice versa.

The Organizer puts everything in order. You can cut, paste, copy, move and delete slides. A miniature presentation view allows you to see what you're going to present.

Common features shared by the Outliner and Slide Editor include 25 pre-designed slide templates and formats for slides and text. Wordprocessing features include a multilingual spell checker, search and replace functions, hyphenation, text import/export and PostScript fonts.

The object-oriented, layered nature of IslandPresents' slides allows for flexibility. Text body and title objects are contained in the slide's front layer. The "format" layer can contain graphics objects. Graphics objects also can be contained in the background layer. Slides that have common formats and backgrounds share objects.

Business graphics and charts are generated with IslandChart, IslandPresents' second module. Chart data can be entered manually or imported from such packages as Lotus 1-2-3, WordPerfect and Informix Wingz.

Predefined chart formats, which can be modified, are included. Chart formats such as pie, line, symbol, area, XY, scattergram and high/low/close are available.

IslandPresents' third component, IslandTable, provides

table editing capabilities that can manipulate both text and graphics. Table cells can be fixed in size or they can dynamically expand to fit around their contents. EPS and TIFF graphics, such as those imported from IslandDraw or IslandPaint, can be cropped within individual cells. Wordprocessing tools can be applied to cells containing text. Numbers contained in cells can be arithmetically manipulated.

IslandPresents also can import graphics in HPGL, CGM and PICT formats. Sun Raster, MacPaint, X11 Bitmap, X Window Dumps and GIF format raster graphics also can be imported. Color and monochrome PostScript, EPS, EPSF, EPSI and TIFF raster files can be exported from IslandPresents. Formats and colors can be exported to other presentations. Presentations can be saved as a template for later use.

Output to HP LaserJet and PaintJet printers is available in addition to the support for standard PostScript printers and imagesetters.

The price for IslandPresents' main module, IslandChart and IslandTable is \$995. IslandChart is available separately for \$495. — David Miller, Senior Technical Editor

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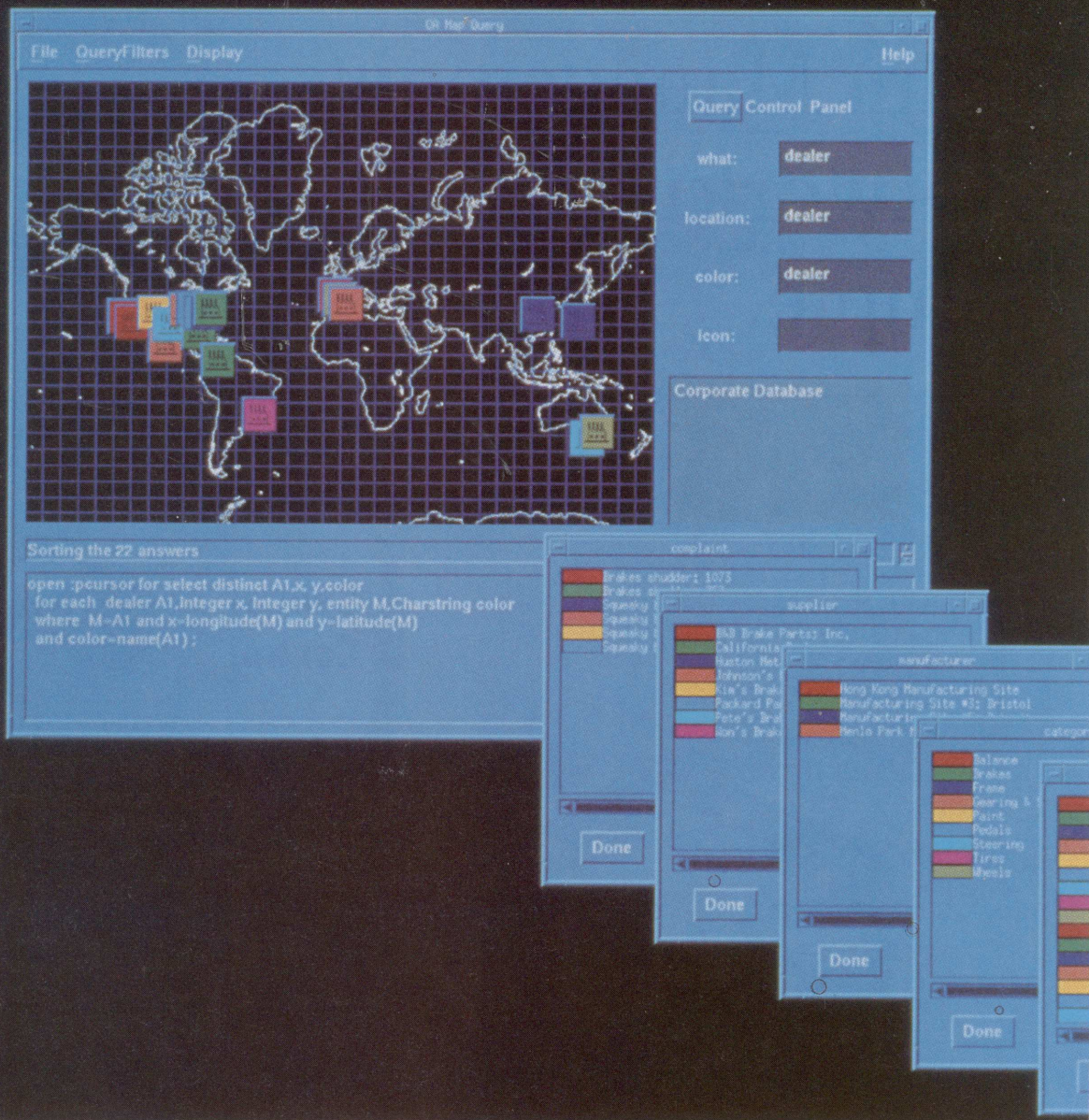
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## HP's Object-Oriented Database

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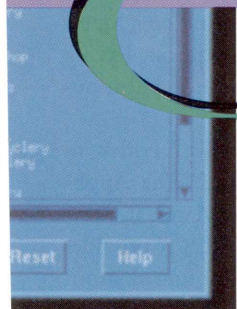
To Far-Flung, Disparate Data

Some time back, Ned Earle met up with one of those opportunities that is bound to either make you look brilliant or crazy — naturally, being an entrepreneur, he grabbed it.

The "it" in this case is a contract for Earle's company, Applications Plus (Irving, TX), to build an information management system. His firm's job is to provide a system that will make possible a seamless flow of design data from the first inklings of a new product through prototypes, testing, regulatory needs, manufacturing, service, product revisions, materials and manufacturing changes and on for years through the product's entire lifetime.

It's fair to say that this is a bit of a task. Earle is not at liberty to divulge the name of the client, because systems of this type are frequently considered competitive advantages. They are guarded fiercely, like good beer. Nonetheless, we do know that the client is a large manufacturing company, located in the





# OPEN ODB

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BY BILL SHARP

midwest. The products are complex and have long lifetimes, so the demands on the system are substantial.

Earle's solution must meet several crucial requirements for his client:

- It must be easy to use.
- It must be capable of working with large amounts of complex data of diverse types and origins.
- It must simplify application additions or changes.
- It must provide fast and easy storage and retrieval of data ranging from scribbles to pictures to spreadsheets and test results to reports, manufacturing parts lists, materials orders and regulatory forms, to mention just a few.

Earle's client company did a study of its own product development cycle and decided it was too long. The company looked at its research and development teams and found that these people spend a large portion of their time searching for and retrieving information. And much of this search time in-

involved necessary changes to existing products, not new products where most of the profit exists. Getting old information out of odd places quickly was a large and costly problem.

The solution to this mess is an object-oriented database, and, because you are, right now, reading *HP Professional*, you won't be too shocked to learn that part of that solution comes from HP. Earle's company is in the systems integration business, where clever people figure out how to hook together a lot of different systems. He and his 55 employees create custom applications for big companies with large problems on their hands. And Earle is very pleased with the core of the system he is building. The core is OpenODB, HP's gift to systems integrators.

Earle's list of system requirements makes his application a ringer for one of the two primary target markets of large ODBMS systems. It is what Doug Dedo, marketing manager for HP's Object-Oriented Database Program, calls a data integration facility.



The intriguing part about databases applied well is that to the casual observer, they may appear superfluous.

The problem at Earle's company X is that the client needs several different data resources linked together to avoid doing things more than once or creating errors and delays. Dedo uses the example of Bellcore, the research arm of the regional Bell phone companies.

"When Bellcore develops a new telecommunications application, they make a custom database to support the applications with the speed they need," says Dedo. This by itself is not a problem. However, when you consider that Bellcore now has some 60 different dedicated application databases available to its regional companies, you get an idea of the issues. As new applications become available, regional phone companies want to use their databases with the applications, but can't because the databases are custom designs. An object database, with its ability to pull in different data formats, allows applications to make use of this data.

In another data integration example, Dedo describes how a pharmaceutical laboratory can tie together its data resources in an automatic hierarchy of linkages. Where regulatory data must go out to different governments around the globe for approval of new medications, models of these requirements automatically pull together data, images and text as required to meet the demands of each nation.

Currently, says Dedo, each effort is handled primarily on a manual basis because current systems can't do the whole job.

This greatly increases the time to get the task completed. And in the pharmaceutical business, that is costly. "The estimates I've heard are that for every year it take to develop a new drug product, it costs roughly \$19 million," says Dedo. "Every week and month they can cut from that process has a significant affect on the bottom line and on profitability."

Another entirely different class of object database application involves geographic information systems. These systems are used by telecommunications companies, governmental agencies plotting services and populations, express delivery firms and aerospace tracking applications. The common relationship between different information types here is spatial, and the medium is graphic, making object databases the best solution.

Whatever the particular object application, however, HP's current offering in the market is heavily skewed toward the high end. Dedo's target customers are database application developers and systems integrators with problems that defy reasonable solution using other databases. HP is not selling a turnkey, end user product, but a development environment and powerful set of tools for making large, complex databases workable.

"This is an automated tool to support sharing of object data on a transaction model basis that guarantees the integrity of your data," says Dedo. HP OpenODB provides capabilities for access to different systems and data types, while providing security and authorization barriers. These features allow developers to add them to applications using the database without having to expend the resources to build them into the applications themselves.

The intriguing part about databases applied well is that to the casual observer, they may appear superfluous. The Applications Plus system that began its tryouts in late March at company X will not be providing new data soon. What it provides is vastly improved ease of finding and getting that information.

Implementations of OpenODB need not even contain data ever to be of great value, argues Dedo. The product helps users get to their information quickly and easily and pull it into whatever form they need from wherever it usually resides.

## [ HP — IBI JOINT DEVELOPMENT PROJECTS ]

HP and Information Builder Inc. (IBI) traded object-oriented favors recently. In conjunction with the March Interex Computing Management Symposium (ICMS) in Atlanta, the two companies announced joint development projects to deliver an HP OpenODB interface to IBI's Enterprise Data Access (EDA)/SQL client-server software, as well as a FOCUS interface to OpenODB.

EDA/SQL products provide access to more than 50 heterogeneous third-party databases and file structures on more than 35 different platforms. According to IBI President Gerald Cohen, EDA/SQL for HP OpenODB will provide users with direct access to non-HP-based data stored in commercial databases such as DB2, IMS, VSAM

and RMS. Availability of the EDA/SQL driver to HP OpenODB is scheduled for early 1993, and pricing will be announced then.

A FOCUS interface to HP OpenODB will speed development of applications that take advantage of HP OpenODB's object-oriented features and underlying structure. According to Richard Sevcik, GM of HP's Commercial Systems Division, the FOCUS interface to HP OpenODB will offer a powerful suite of decision-support tools that complement OpenODB's ability to manage complexity.

FOCUS is the most widely used 4GL for information systems with more than 7,000 installations and one million users.



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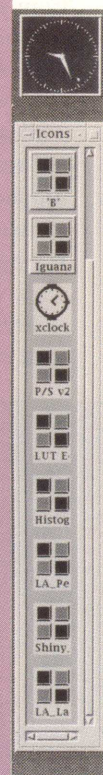
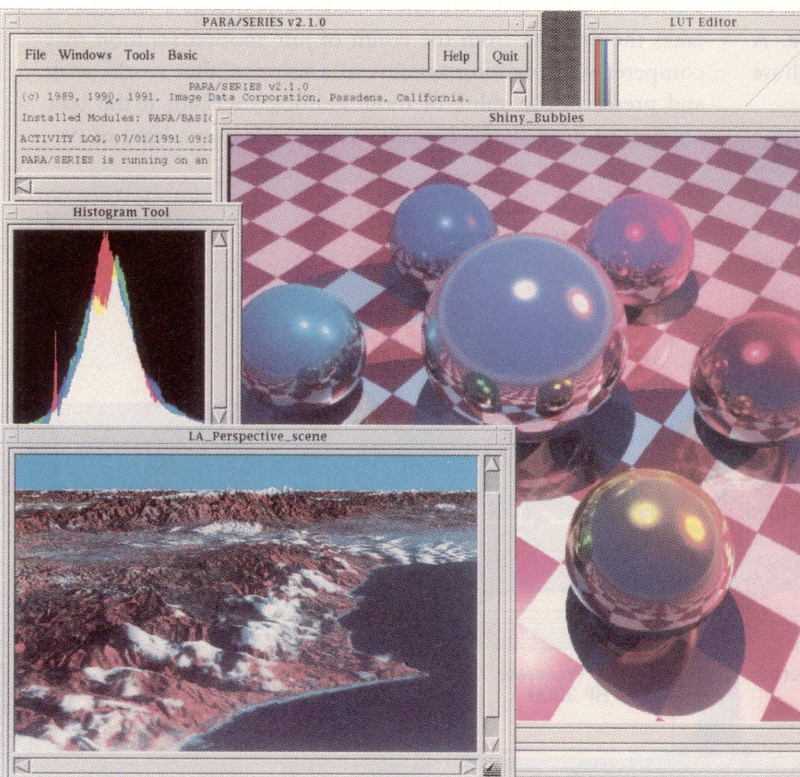


Photo courtesy of Image Data Corporation, Pasadena, California. 818-796-9155



The above image of the Los Angeles basin was merged from Landsat satellite data and USGS terrain elevation data on Silicon Graphics' 4D/240 system. It took 128MB of main memory and 2GB of disk storage.



In setting up the object database, the systems integrator or IS department defines a particular object that includes the data in question, along with how to get to it. The user will likely never know a database is in use, or that the information he so badly needs is stored in DB2 format on an IBM mainframe in Minnesota — all they need to know is to double-click on the icon, and the data shows up.

We might as well deal with the price factor here. HP's OpenODB is not a product that many of us need to rush right out and glom onto. It is designed for complex applications that will be used by large numbers of people working with many different data types that need to be stuffed into and yanked back from several different places. A none-too-subtle indication of the rarified intended audience for this product is its price. A \$100,000-plus product is not my idea of a place to keep all those home-made cat food recipes.

But if, rather than cat food, you're building airplanes, those old recipes become rather important, as do the testing results, suppliers lists, schematics and lots more. And you can't have all that data flying around loose. As Dedo puts it, "Instead of having a plane that is 3,000 parts flying in close formation, you want everything bolted together." Object databases have the ability to bolt that airplane data together with considerably less total effort than would be necessary through other methods.

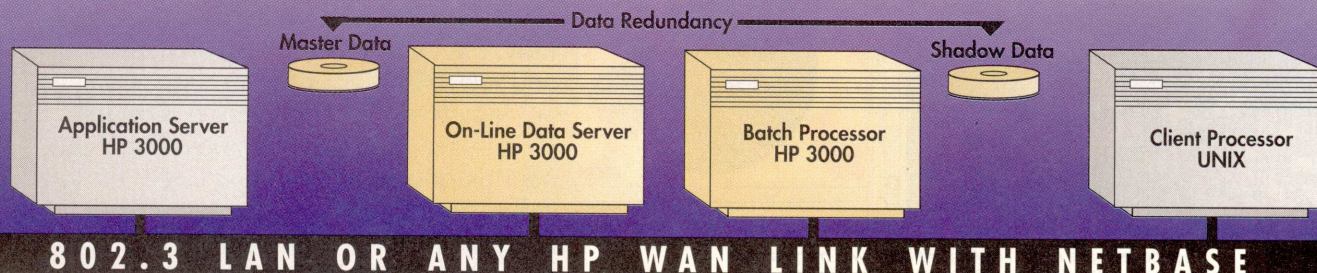
Part of the ability to tie things together with OpenODB is the effectiveness of the object-structured query language (OSQL) HP developed. It combines some of the best of object and relational database ideas on queries. HP has approached the Object Management Group and the American National Standards Institute about making OSQL a standard.

OpenODB also has programming interfaces with several programming languages, so that it can work with any reasonable object or third-generation choice. A graphical browser allows developers to cruise through databases looking for reusable code in setting up links to existing resources.

That ability to work cleanly with existing databases and resources is what will ultimately make OpenODB a success. It takes the product from the realm of just another solution that competes with existing systems to a solution that works with and preserves the value of those existing solutions if the user chooses to keep them. It makes OpenODB into a kind of sys-

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- ◆ Support for NFS clients



tems integration software. It is a market in which the product is already quite successful.

### Putting It To Use

**M**EANWHILE, BACK IN IRVING, TX, things are moving along rather nicely for Ned Earle. Applications Plus project manager John Catalano and his team have completed work on the database engine and have turned over the engine and the first application to the client. They plan on adding a new application about every two months, while closely monitoring performance of the database system.

"During the next year or so we will have about six or seven different data types, and that may well grow to 10 or 15 types," says Earle. "They will be using the database to pull together existing data from R&D, development engineering, manufacturing engineering, marketing, procurement, standards and on-going product marketing."

The database is set up in a kind of catalog format, listing all the product data stored in the different departments. "Let's say that a researcher wants to find all sorts of information on left-handed blue frames," supposes Earle. "They can look at icons

representing the original plans, parts vendors, testing information, product and marketing research and manufacturing information, all listed in the catalog."

"If they double-click on the parts proposal from a German company, they can find the tabular data they want. Then they can quickly move that tabular data into a new proposal they want to make to a French parts company."

"The data may be in UNIX or DB2 or whatever. The methods to get to the information are encapsulated with the object in the database, so that basically we are just doing a system call. That simplicity makes the whole concept much more feasible."

The user sees the data in essentially a transparent form. They don't know or care where or how the data is stored — they just want it, and the system provides it.

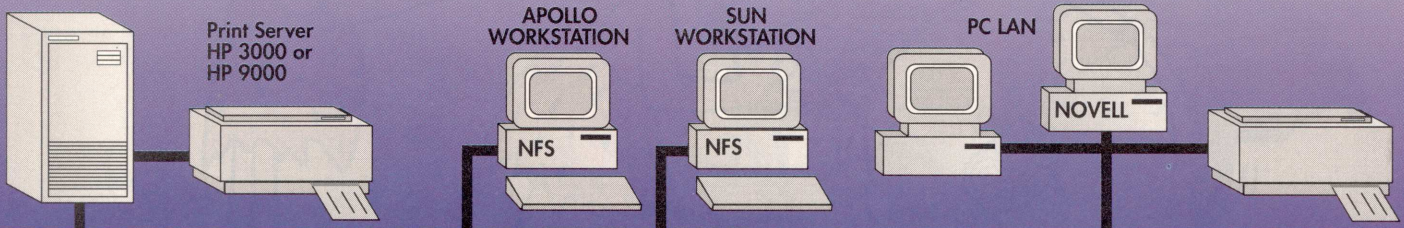
If such a project were attempted with a relational database, says Earle, "We wouldn't be trying to create these on-line links with different types of data. It could be done without an object database, but it would be much more difficult. This is a leading-edge application."

Now, where did I leave my test data on that left-handed blue frame?

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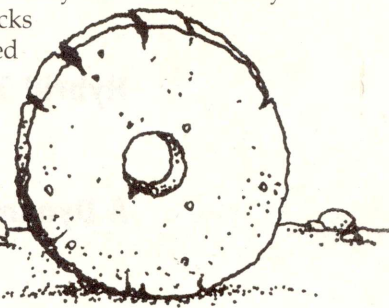
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# Object-Based Hybrid Tools

By Ross G. Hopmans

**By Combining OOP,  
Expert Systems And GUIs,  
Hybrid Tools Create  
A Dynamic Software  
Development Environment**

bject-oriented programming (OOP), rule-based reasoning (expert systems or ES) and graphical user interfaces (GUIs) all incorporate technologies that have come to be recognized individually for their importance to software development. These techniques have led to a reduction in development time, a dramatic lessening of the maintenance effort and an increased effectiveness in the resulting application.

Hybrid tools combine object-oriented programming and rule-based reasoning with a GUI in a highly productive development environment. To better understand the importance of hybrid tools in the development of expert or knowledge-based systems, we should examine their characteristics.

Where possible, I will reference Kappa-PC from IntelliCorp as a good example of a hybrid tool running under Windows 3.0 on a standard PC. Written in C, Kappa-PC provides an advanced, tightly-integrated graphical development environment.

In the past couple of years, we have seen a migration from simple rule-based expert system tools to object-based hybrid tools. As expert system developers move from smaller prototypes to fielding midsized systems, they require the additional power and clarity that hybrid tools offer. These tools are becoming widely available under Windows 3.0, which allows sophisticated applications to be developed and delivered on the PC — increasingly the platform of choice.

The earliest research in expert systems development was done with rule-based tools like Stanford University's Emycin and Carnegie-Mellon's OPS5. These tools incorporated object-oriented concepts such as classes, instances and inheritance. IntelliCorp's KEE, the first commercial expert systems building tool, was introduced in 1983 and combined object-oriented techniques with rule-based inferencing. In addition, KEE provided developers with several powerful features, such as demons





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## The representation of facts and the relationships between facts is key to an expert system.

(or methods) and pattern matching rules. This capability is still the state of the art today and is only available in systems that provide both rule-based reasoning and object-oriented programming.

The term "hybrid" means that the tool incorporates several different ways to represent knowledge and handle inference. These include object-oriented programming, pattern matching rules (or rules with variables), heuristics and bi-directional rules (using the same rules for forward and backward chaining). In addition, because the development of complex systems requires rapid prototyping and frequent modification, we need graphical views of the knowledge base, high quality browsing utilities and the ability to set breakpoints to interrupt a consultation. We also look for techniques that make it easy to develop a good user interface.

Kappa-PC provides a variety of graphic images for the user interface in order to observe and control the operation of a knowledge base. These include buttons, bitmaps, icons, drawings, state boxes, meters, line plots, sliders, pop-up menus and dialogue boxes. Images can be used to display the value of important parameters and observe how they change while the system is in operation. Many of the images are actuators as well. We can set the values of the parameters they monitor by changing the value shown on the actuator. Other images mimic the operation of switches or push buttons. We can use these actuators to operate an application, much as we would use real switches and buttons.

### Expert Systems

**T**YPICAL USES FOR EXPERT systems are help desks, equipment configuration, fault diagnostics, underwriting, loan approval, sales support and a broad array of decision support systems. The representation of facts and the relationships between facts is key to an expert system. These relationships may involve heuristic knowledge (or rules of thumb) that will allow new facts to be inferred from existing facts. In addition, an expert system must be able to control the procedural flow of the consultation and it must have an effective user interface.

Simple rule-based tools used in the past to develop expert

systems represent both facts and heuristics as rules. Some rules establish facts and relationships while other rules make inferences. Most procedural control also gets embedded in the rules so a simple rule-based system can quickly grow deceptively large quite quickly, becoming cumbersome to understand and maintain all without adding to the base of knowledge.

Superficially, it may appear that a small backward-chaining system is easier to create because we simply write rules. However, as the system grows the rules may get far too specific and we will need some rather complex control rules. Because inferencing takes time and memory, the system slows down as more rules are added.

In rule-based programming, each rule specifies a set of conditions and a set of conclusions to be made if the conditions are true. The conclusions may represent logical deductions about the knowledge base or specifications of how it changes over time. Each rule is a relatively independent module so we can build reasoning systems gradually, rule by rule. While a significant amount of knowledge can be stored directly in a knowledge-based system, the power comes from its ability to inference, or reason beyond the knowledge directly stored.

### Object-Oriented Programming

**W**HEN THE USER HAS TO create an underlying model of the application — such as is usually required for design, planning, scheduling and even complex diagnostic problems — OOP has proven to be ideal. OOP is characterized by encapsulation of the data and procedures (methods) into objects, inheritance of the data and procedures through object classes and message passing as a means of object communication.

Object-oriented programming provides a more natural way of representing the world because we think in terms of objects like people and animals. It is important to note that when we think of an animal like a horse, we think of it as a whole. A horse has data associated with it. For example, horses are mammals and horses have four legs. But we also associate certain behavior with horses such as the ability to run fast and the capability to damage smaller mammals when they come into contact with a horse's hooves. It never occurs to us to separate the data from the behaviors (or procedures) associated with it. However, this is exactly what we do in conventional programming.

Object-oriented programming gives us the ability to develop hierarchies of objects through which we can describe everyday situations in a much more natural manner.

In the real world, objects generally are not unique. They share characteristics with other similar objects and many of the objects in a typical knowledge base represent classes. This allows us to reason about a class as a whole. For example, if we know that cars are heavy and can go fast we can conclude that it is dangerous to be hit by a car. We do not need to draw this



conclusion for each car we encounter. In addition, when we know that an object is of a recognized class, we can make assumptions about it without knowing details about the particular object. For example, even if we have never seen a 1986 Chevy Sedan, we can assume it is heavy, goes fast and is dangerous if it hits us because it is a member of a class with which we are familiar. We also have the advantage of learning something new about all members of the class when we learn something new about the class itself. If we learn that all automobiles have engine blocks, we can now assume that a 1986 Chevy Sedan has one as well.

## Combining OOP And ES

**O**BJECT-ORIENTED PROGRAMMING has provided us with sophisticated ways of representing knowledge in expert systems and it has revolutionized the way we analyze problems and design software programs. Before we can simulate and reason about a complex system, we need to be able to represent the knowledge about the system effectively. A good candidate is any system where we understand how the components interact but where there is too much complexity for us to predict the behavior of the entire system.

A hybrid tool allows us to build a realistic model of our problem domain. The components of the domain are represented by structures called objects. Objects either can be classes or instances within classes. This allows us to represent not only concrete things like "automobiles," but also abstract concepts like "ownership."

The relationships among the objects in a model can be represented by linking them together into a structure called a hierarchy. Graphic editors and browsers within hybrid tools allow developers to visualize the object hierarchy as a whole or focus on specific areas to add and modify the objects. We then can use OOP tools within the hybrid tool to endow these objects with methods (i.e., inherited programs or processes) which specify what the objects can do. Once we have constructed the objects and methods for a knowledge base, we can construct systems that specify how objects should behave or that can reason about the objects by using rules.

It is interesting to note that Kappa-PC has stronger object capabilities than object-oriented languages like C++ and Smalltalk. For example, C++ limits the developer's ability to create unique class-level slots and methods whereas Kappa-PC does not. In addition, Kappa-PC allows developers to associate constraints with class-level slots and it supports methods that automatically fire whenever the object or slot is accessed or changed.

In developing a Kappa-PC application, we first must define a set of objects. Each object represents something that is important to our domain. The object can be a physical object like a particular automobile or it can be a group or class such as red

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automobiles or sports cars. It also can be a concept like an equipment fault. In Kappa-PC, objects are either classes or instances where a class is a group or collection. "Sedans" is a class. "Mary's Car" is an instance.

### Unique Properties

A COMPLEX PROBLEM CAN BE characterized as one for which the correct solutions are unknown or are too numerous to specify. However, the backward chaining capabilities of a simple rule-based tool require that the developer enumerate all of the possible goals. As a result, backward chaining systems are used for simpler types of problems. Hybrid tools allow bi-directional chaining where the developer writes all rules in a single format and then uses the same rules for both forward and backward chaining as required.

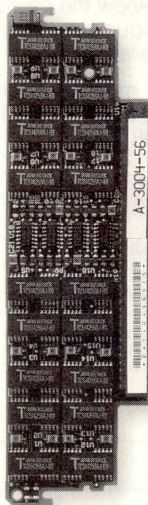
Hybrid systems also support pattern matching rules that contain one or more variables. Any part of the rule may be replaced by a variable which can be any valid expression. During the pattern matching process, the variable portion of the rule is bound and the binding is used consistently. In effect this allows the system to generalize across classes of objects. One

pattern matching rule can do the work of hundreds of simple rules and this is one of the keys to the power of hybrid tools.

When we examine the choice of developing an expert system with a simple rule-based or a hybrid tool, the hybrid software quickly becomes much simpler to use and understand. Hybrid tools allow us to represent knowledge as objects that have the advantage of mapping directly to things in the real world. As the number of objects grows, we can create hierarchies that show the logical relationships between different types of objects. The objects maintain the clarity about the facts being represented in the knowledge base and they make it easy to edit the factual structure of the system. Hybrid tools have an added advantage of allowing those first prototype applications to gracefully grow into more complex applications that would be impossible to develop with a simple rule-based system. At the same time, we reduce the number of rules required which in turn reduces the memory and processing time required.

Hybrid tools allow us to choose the best processing method for the task at hand. If a reasoning process requires few conditions but instead calls for a predetermined series of steps, then rules may be inappropriate. This is the case for many mathematical calculations. Rules are useful if there are a lot of conditions to be handled and the conditions can be broken up into

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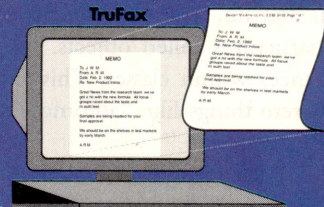
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Hybrid tools allow us to represent knowledge as objects that have the advantage of mapping directly to things in the real world.

small rules. Moreover, hybrid systems offer a choice of depth-first or breadth-first chaining for increased control and they permit specialized debugging and explanation tools for the developer as well as the end user.

The processes of the domain in Kappa-PC are represented in three different ways: methods, functions and rules. Behavior of slots is determined by creating methods which specify how

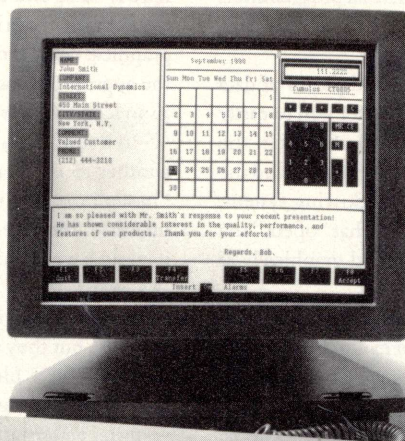
an object can behave. Functions are analogous to functions or procedures in conventional languages. IntelliCorp provides a library of functions with Kappa-PC and we can create our own with the Kappa Application Language (KAL) or "C" for procedural control. Finally, rules represent the steps of a process. Rules can specify complex interactions among the components of the system.

The syntax for methods, functions and rules is identical in Kappa-PC. We use the same syntax to add an object, write a method and create a rule. Kappa-PC also provides an integrated interpreter that allows the developer to create and test portions of the application dynamically. In fact, everything that can be accomplished through the many graphic editors can be done through the KAL interpreter. The integrated programming language (which is very C-like) is a very nice feature of Kappa-PC and it provides all of the procedural control required by production systems.

Methods might be defined as private functions that change the value of slots. Kappa-PC allows methods to be associated with a slot "if needed" and the slot has no value, "before change" and "after change." For example, a method may be associated with the "Autos" class that computes mileage given the distance driven and the amount of fuel consumed. When a

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request for mileage is issued to the mileage slot the method will automatically retrieve the distance and fuel slots and do the calculation dynamically. This is all hidden from the issuer.

### Problem Solved

**K**NOWLEDGE-BASED SYSTEMS often deal with complex problems which may be poorly defined. They require a network of facts and heuristic rules. Their solution depends on logic and an inference engine that can dynamically create a decision tree, selecting which heuristics are most appropriate for the specific case being considered. The capabilities provided with hybrid tools, combining object-oriented programming, rule-based reasoning and a graphical environment

support, rapid prototyping and make it easy to create a high quality, effective user interface.

But hybrid tools do more than just combine OOP, ES and GUI technologies. They allow us to solve problems that could not be effectively solved before. In addition, they are becoming very similar to CASE tools in that they provide a descriptive, graphical model of the domain. As software architectures continue to advance, I believe we will see hybrid tools, object-oriented databases and CASE becoming a single technology. — *Ross Hopmans is general manager with Brant Technologies Inc. of Mississauga, Ontario. As senior consultant, Mr. Hopmans has developed expert systems for a broad range of industries since 1985.*

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## [ HANDLING OBJECTS FROM A GUI ]

In "real life," objects are easy to understand because you can see them and you can classify them easily by their appearance. For example, we know cars have wheels, a frame and they are bigger than a person yet smaller than a bus. In "real life" we also can see what "methods" are available by looking at objects. For example, a teapot has a lid that lets us add the water, a handle for moving the teapot from one location to another, and a spout for pouring out the water.

The basic premise of object-oriented programming (OOP) is that business functions and applications are broken up into classes of objects, which can be reused. When objects move beyond the programming level and become part of the graphical user interface (GUI), you'll be able to share the productivity gains that programmers have by using objects. In addition, you will be able to interact with your computing system in an entirely new way.

Although objects will allow you to reuse bits and pieces of data to create new reports or data, it does create the need for you to easily identify objects and their classification. In the world of objects, the GUI takes on the important role of helping you better understand the classification and functions of objects. Using a windowing system, you can see what's inside an object by using software that "opens" the object into a window and the contents are displayed graphically as icons or pictures.

Each of these new objects can be opened in the same way to allow you to explore the organization of the objects. For example, a "book" object might be opened to show "chapter" objects, and these might open up to show as "page" objects and "paragraph" objects and so on.

Object "methods" are procedures that are associated with objects. For example, a container object has a method such as "list" that returns a list of its contents. A text file might have a method "print" which includes a parameter specifying a printer. The object has to print itself to the specified printer using internal facilities or call an external program.

In a graphical environment, the "methods" can be handled graphically. When an object is shown as an icon and the object is

clicked on with the mouse, the "activate" or "open" method can be sent to the object — which then opens itself onto the display.

Pop-up menus are a useful way of finding out what methods are available for an object. You move the mouse to the object, press down on the mouse button (button 3 when using Motif) and a menu "pops up" listing the available methods. A document icon might have methods such as open, print, discard, archive and show.

Some object methods need parameters. The print example above required a destination. Another example is sending mail. A document could be E-mailed using the mail method and a parameter giving the address of a user. The most appropriate visual analogy that can be used here is "drag and drop." By employing drag and drop functionality, the document can be dragged onto a printer icon or mail icon and the graphical environment invokes the appropriate method and provide the appropriate parameter. In addition, you could drag a document to an icon for a user, and the document would be mailed to that user.

In a similar way, you could drag an icon from one container to another to cause a "move" method to be invoked. By having the "move" method in the object rather than tied into the graphical interface, the object would keep an audit trail of its movements, or it could have an "undo" method which would reverse the operation at a later date.

Graphical environments for X may offer object manipulation facilities, but they also need to be able to figure out what to do with normal UNIX files on the system that aren't real "objects." The technique used varies, but generally follows the "Hybrid" approach — using pattern matching rules and heuristics that are used to match sets of methods to filenames.

In the long term, these two models will merge as file systems become more object-oriented. It's only a matter of time before the tools and services of an object-oriented framework will be readily available. Until then, users and programmers alike will just have to await the emergence of objects on the desktop. — *Clive Feather is technical director and chief architect at IXI, San Ramon, CA.*



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# Lessons In Object Orientation

An Esteemed Expert Reveals That Object Orientation  
Isn't Just A Good Idea — It's The Law

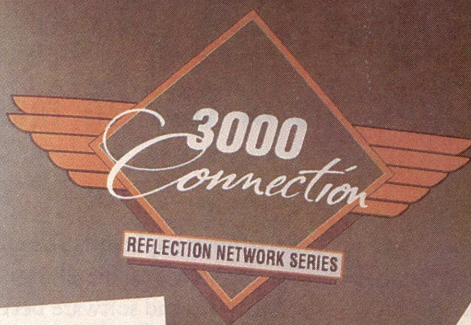
The issues of object-oriented system design and programming bring up thorny technical and philosophical questions. When faced with such questions I usually can find no better source than the thorny, technical and philosophical Dr. Perkin T. Fudd. Fudd — erstwhile academic and progenitor of Fudd's Laws of Computing, which he milks for a comfortable living on the lecture circuit — always seems to have a good grasp on the subject. Even when he doesn't, he makes good press.

Fudd's first Laws of Computing were his Laws of Disaster Recovery, published during his brief stint at the University of Pennsylvania, after somebody tripped over the power cord of the ENIAC computer and Fudd was called on to restore the beast to functionality. Fudd still vehemently denies having pulled the plug, even when he isn't asked about it.

Fudd followed up this effort with two of his better works: his Laws of Scientific Computation, which is regarded as his

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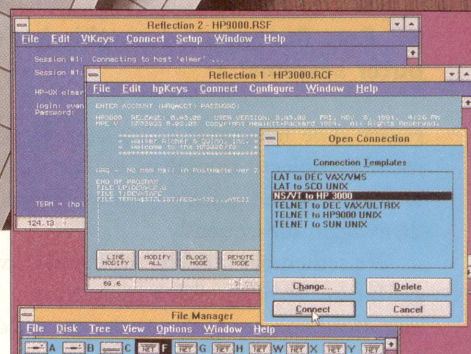
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# We expect to see object-oriented COBOL variants soon, and ADA supports enough of the concepts of OOP to make it useful.

seminal work to date, and his Laws of Computer Networks and Standards along with literally countless lesser works. Fudd is currently refining masterwork, Laws of Object-Orientation and Software Engineering, for publication. He recently took time out to share his thoughts with us.

## **HP Pro:** Dr. Fudd, what is object orientation?

**Fudd:** The Newtonian universe is made of objects. Objects that we can see, hear, feel or otherwise sense. When we do something, we do it to an object. When something is done to us, it is done by an object. At least we perceive things that way. Human intelligence, and our ability to cope with our environment, is based on our ability to abstract these objects, classify them and use the information effectively at a later date. We call it experience or learning, but it's really object orientation.

## **HP Pro:** But what does this have to do with computer systems?

**Fudd:** The benefit of being able to abstract, classify and remember objects around us is that we use the information to react reliably and quickly to those objects when we interact with them again subsequently.

We remember quickly, for instance, what happens when we get hit in the head with a rock thrown by our cruel elder sibling. If we subsequently see the cruel elder sibling with a rock, it will trigger a quick and appropriate response.

The tie-in to computer systems is this: A good computer system also must be able to react appropriately, reliably and quickly to its environment. It, too, must become experienced and learn. It, too, must use object-orientation.

## **HP Pro:** That sounds more like artificial intelligence.

**Fudd:** Don't call it that. I haven't given an AI lecture in three years. I can't even get a booking at the ACM convention. I'm changing my Laws of AI (make sure you use the trademark) to Fudd's Laws of Fuzzy Logic and Neural Networks. That should pay some bills.

Anyway, I don't consider the intelligence of a computer system to be artificial by any means. A computer system consists of three parts: hardware, software and wetware. The hardware and the software provide processing power and memory. Those are very real mechanisms. The wetware, which consists of the

programmers, operators and users of the computer system provides the very real intelligence that drives the mechanism. If the hardware and software become more capable, and add some "artificial" intelligence to the system, it's a bonus.

## **HP Pro:** Doesn't that mean that every computer system is object-oriented?

**Fudd:** Indeed, any system must be considered object-oriented. The wetware is constrained to think in terms of objects. Therefore, the system of hardware, software and wetware is, ipso facto, object-oriented. Actually, this is my First Law of Object Orientation and Systems Engineering (TM): "All systems are object-oriented, whether one thinks so, or not."

The problem is that the hardware and software have not historically been sufficient to support the object-orientation of the wetware. That's why the systems traditionally have been so difficult to program, operate and use. The wetware is thwarted in its every attempt to act within the system. We haven't had the right tools.

## **HP Pro:** What kind of tools are available to help build object-oriented systems?

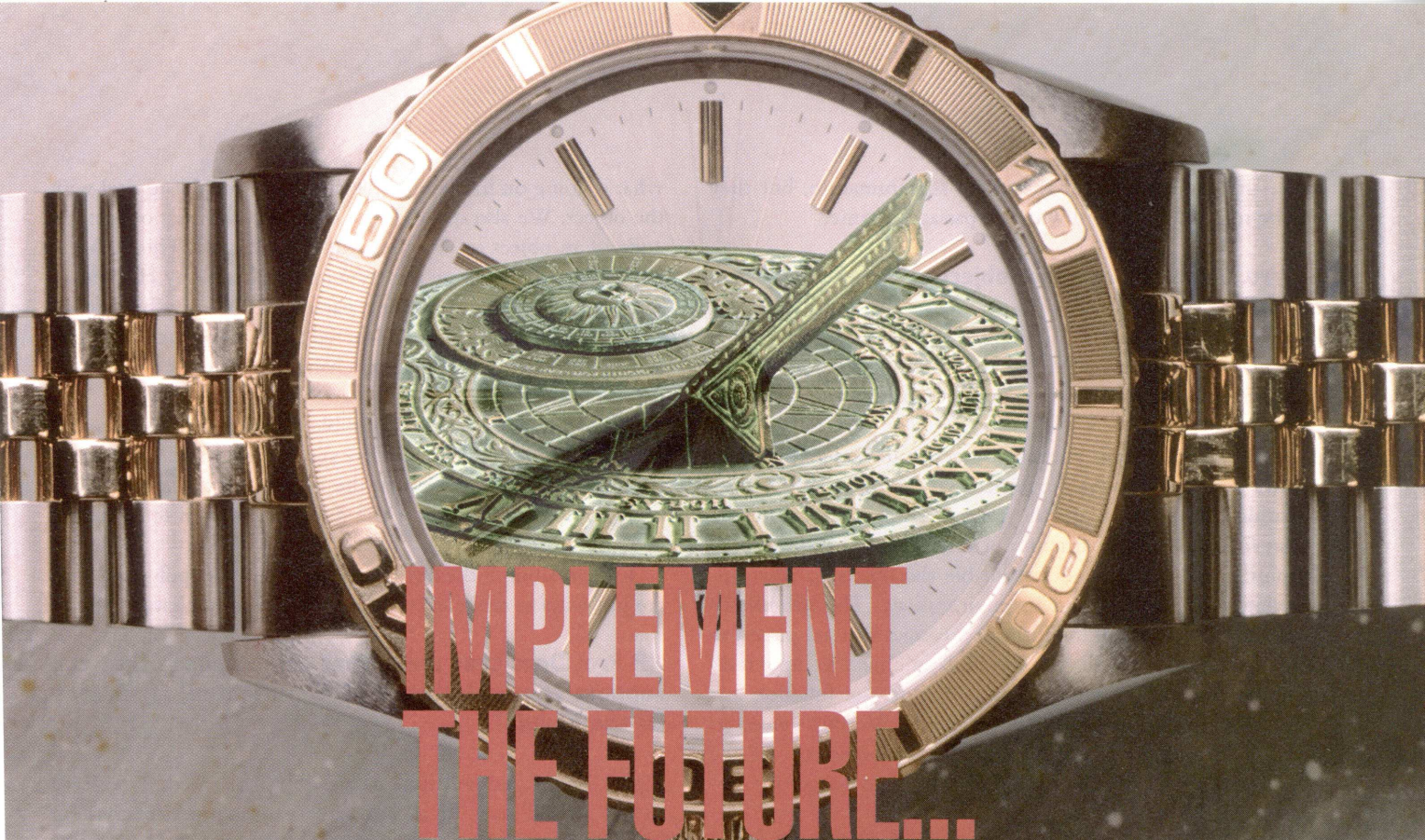
**Fudd:** Well, we start with graphical user interfaces. GUIs are useful for implementing an effective interface for the wetware. A good GUI allows the programmer to represent objects visually, and to allow them to be manipulated intuitively, using paradigms that are familiar to the user. The desktop metaphor used by most GUI environments is a prime example.

Then there are the object-oriented programming languages. Smalltalk, C++ and various dialects of object-oriented PASCAL are available on many platforms. We expect to see object-oriented COBOL variants soon, and ADA supports enough of the concepts of OOP to make it useful.

Visual programming tools also can help. Like GUIs, such tools help programmers see objects and the relationships between them more clearly. Tools like Microsoft's Visual Basic, Borland's ObjectVision and HP's Visual Engineering Environment are prime examples. These let programmers manipulate iconic symbols and prototype or develop production systems very rapidly compared to conventional methods.

Database management systems, operating systems and system management software also are being developed to support the object-oriented paradigm more effectively. Many of these





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tools, and the markets for them, are still immature, but they will be increasingly useful with the passage of time.

**HP Pro: What distinguishes object-oriented tools from traditional tools?**

**Fudd:** The stock answer is that they provide support for the three principles of object-orientation: encapsulation, inheritance and polymorphism.

Encapsulation means putting a wrapper around an object so that we don't have to see the unnecessary detail of an object.

Inside this wrapper are the characteristics that define the object for us — a data structure of some type — and the programming, or methods — that enable the object to react appropriately to stimuli from its environment. The stimuli are applied to the object in the form of messages that are passed to the object from outside itself. If we tell an object to draw itself or move around the screen, it can perform the function autonomously, using its predefined methods. We don't need to know how to draw the object, or move it ourselves. All we need to know is the proper message to send to trigger the desired response.

Inheritance allows an object to share characteristics and methods with other objects that are similar to it. An example would be a circle and an arc. An arc is no more than an incomplete circle. We can describe a circle with two characteristics: a center point in 3-space and a radius. An arc inherits those characteristics and adds to them an angle to specify the starting point of the arc, and an angle to tell us where the arc ends.

The arc might also inherit a "move" method that redraws it in a new screen position from the circle. If we tell either the circle or the arc to move itself, we send a message to the object giving it a new center point. The object then could erase itself from the screen and redraw itself at the new coordinates by invoking its own methods.

The method we use to move either a circle or an arc would be the exact same method. A single method would be shared by the two objects. The "draw" methods called by the "move" method would be different for each object, of course, but the arc would directly inherit the move method used by the arc.

If all the methods used by two objects are exactly the same, inheritance is all that we need. In the circle/arc example, however, we see that the methods are not all alike. We have to implement a different "draw" method for each object class. This is where polymorphism comes in. Polymorphism lets us substitute methods that allow an object to behave differently than its ancestors, even when given the same message stimuli.

**HP Pro: That's pretty abstract. What's the practical effect of these concepts?**

**Fudd:** Abstraction is the point! Encapsulation lets us abstract an object so that the programmer or user never has to know

what is going on inside of it. This makes it simpler to deal with the object. We also can hide the data characteristics or method code of an object so that they can't be changed. This makes it impossible for someone to screw up the system by changing a data structure or a subroutine parameter. If everything in an object is encapsulated, we are forced to define a descendant object of our own if we want to change an object's methods or data characteristics.

This abstraction makes it possible to write code that is more modular and more reusable. Encapsulation provides the security mechanism to insure that the objects are stable enough to be reusable, and it enforces the discipline needed to make the code modular.

Encapsulation is the key here. Inheritance and polymorphism are just ways to make encapsulation easier to implement.

**HP Pro: Does that mean that any language that can support encapsulation is object-oriented? If so, why all the hoopla?**

**Fudd:** Like I said. All systems are object-oriented. That leads to my second law: "If all you have is a hammer, everything looks like a nail." You don't necessarily need new tools to create an object-oriented system, but even a good hammer is limited in what it can do, and the best hammer can't turn a screw. The proper tools help us do the job better. All the hoopla, as you put it, is about the new tools that are showing up to make object-orientation much easier to accomplish.

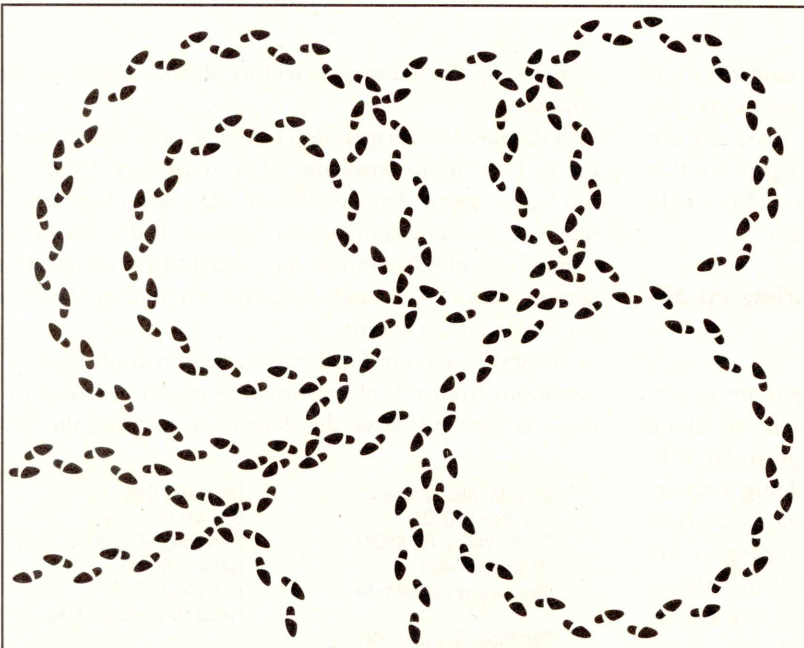
**HP Pro: What is the best object-oriented programming language?**

**Fudd:** The best language is Smalltalk. It was designed from the ground up to support OOP, and it is a "pure" language that enforces the OOP paradigm. Unfortunately, it's too obscure for most of the pinstriped set, and hasn't entered the mainstream yet. Companies like ParcPlace, a spin-off from the Xerox Palo Alto Research Center where Smalltalk and GUIs were pioneered, have ported Smalltalk to a large number of platforms, including the Mac, PC clones and most UNIX derivatives. Other vendors, like Tigre Object Systems, have developed programming tools to simplify programming and to allow the use of different GUIs with the same Smalltalk code.

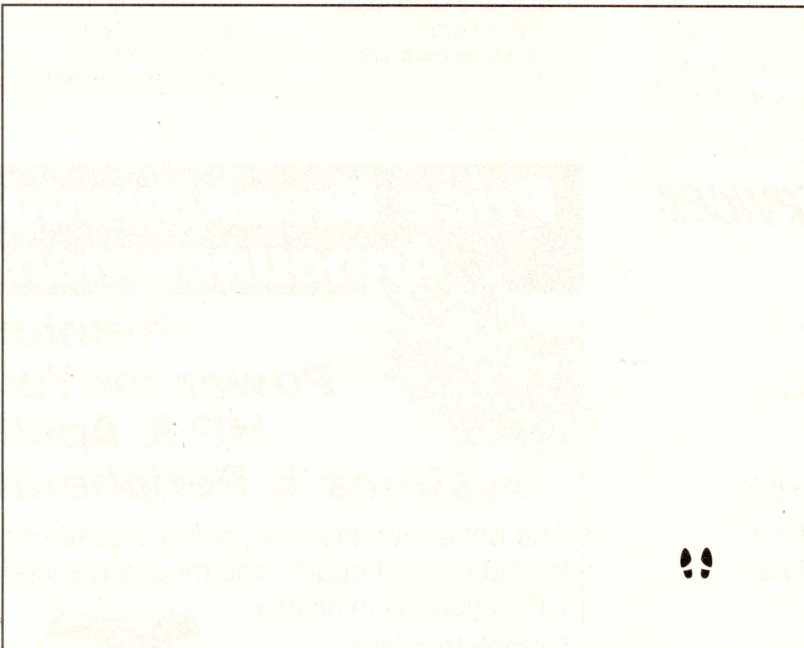
C++ is becoming popular, but it carries the stigma of being C on steroids. I have irrefutable proof that both C and UNIX were part of a bad practical joke created by some clever fellows at Bell Labs. Unfortunately, it escaped the confines of that august institution and was taken seriously by many of my lesser colleagues in academia. As a matter of fact, that's when I got disgusted, and left Berkeley to become a consultant.

PASCAL is as dead as the mathematician it was named after. I like the language myself. It's certainly more palatable than C, but it barely exists outside of the PC world. Object-oriented





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COBOL could be a big hit, but we need some standards for it first. Micro Focus is pushing for OOP feature standards for COBOL, and is implementing some of them this year, but the CODASYL standards committee took 20 years to figure out that COBOL needed intrinsic date-handling routines. I don't hold out much hope for an OOP standard in this century.

### HP Pro: Is confusion about standards holding up object-orientation?

**Fudd:** It's part of the problem. Many IS managers are uncertain about the direction that object-oriented tools are taking and how standards are going to emerge. Some go so far as to complain that companies like Micro Focus are doing a disservice by implementing OOP features in COBOL before standards are released. Object-oriented databases are just emerging and aren't for the faint of heart. HP's OODBMS shell for Allbase costs \$100,000 per copy, and is only useful for large (500+ user) HP systems.

There are standards, though. C++ is an ANSI standard. The Object Management Group, of which HP is a charter member, has defined a network object request broker that can identify and distribute objects across a multivendor network. If that's

accepted by the industry, it will standardize many system-level objects.

Still, most IS managers don't even want to think about hacking in C or using Smalltalk. They want their COBOL. Who can blame them? Anyone who would code a big business system in C should examine their motives. If that doesn't lead to a modicum of self-control, they should be confined to maintaining old COBOL batch programs where they won't endanger themselves or society.

It's too bad about Smalltalk, because it really doesn't allow deviations from the object-oriented model. Variants of existing languages still leave the door open to using the old para-

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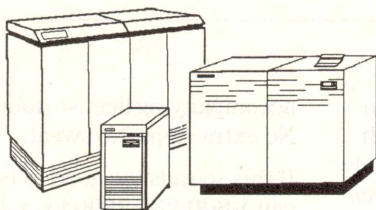
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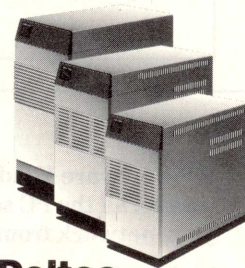
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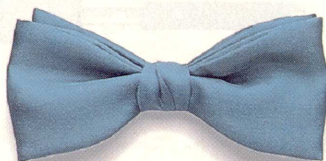


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digms when one gets into a difficult spot. Smalltalk forces one to think through difficult design problems. The other languages allow one to hack oneself through.

Another problem is that IS management tends to view object-orientation as another problem to be solved, rather than as a solution to existing problems. The rigor of the software engineering required for effective object-orientation scares them witless. Others are pinstriped muttonheads who wouldn't know a good idea if it goosed them with a polo mallet.

**HP Pro:** But software engineering is a controversial issue. There are those who say that software development is a creative process — an art, rather than a science.

**Fudd:** Whenever a scientist can't solve a problem, he turns it over to the philosophers. Once the philosophers grind it up, the artists take hold of it. Software development has been turned over to the philosophers and artists because the scientists don't know what to do with programming. These same scientists are the people who came up with FORTRAN, C and APL for crying out loud! You think they have any idea how to model a real-world process for a business system?

People think more naturally in terms of objects. Software engineering should be easier using the object-oriented model. It's harder at first than artistic methods because of the discipline it requires, but the modularity and reusability of properly designed object-oriented systems will make the job faster and easier in the long run.

**HP Pro:** What about the up-front design work that OOP requires?

**Fudd:** Just remember my fifth and seventh laws: "Abstract and simplify your systems as much as possible, but not too much."; and "Design now or re-code later."

**HP Pro:** What are your other Laws of Object-Orientation and Systems Engineering (TM)?

**Fudd:** Do you think I'm doing this as a public service? I'm entitled to earn a living. Buy the book or sign up for the seminar. Now get out!

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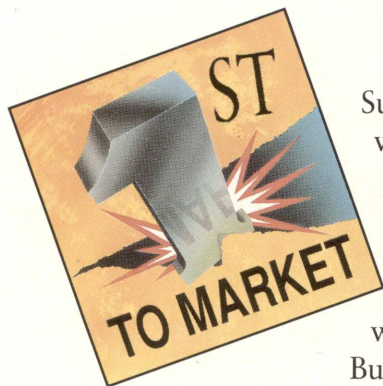
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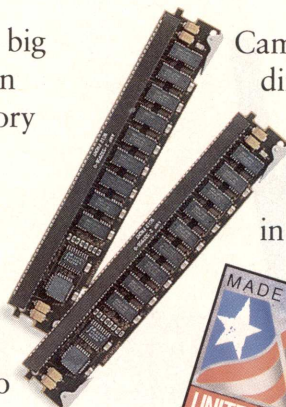
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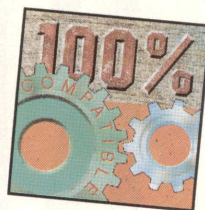
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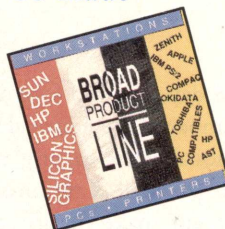
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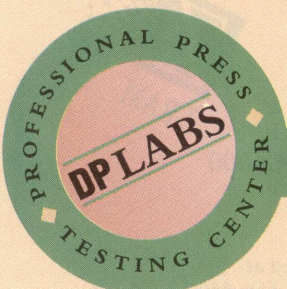
I remember the day, not too long ago, when every member of the editorial staff here at Professional Press eagerly took delivery of their personal X terminal. X terminals didn't just make things easier for our editors, they changed their way of work life. And those who at first were a bit apprehensive now guard their X terminals with their lives.

X terminals have improved dramatically since their early days, with prices

decreasing and performance increasing. This month, we tested an SGS-17C color X terminal from Samsung Information Systems Inc. (San Jose, CA).

The SGS-17C sports a 17-inch non-glare color monitor with 1024x768 resolution and a .31mm dot pitch. The terminal can display 256 simultaneous colors from a palette of 16.7 million. Input devices feature a 101-key PC/AT style keyboard with multi-language sup-

By David B. Miller





**T**he SGS-17C has no fan, thus making it really attractive for quiet office settings.

port and a three-button serial mouse. One output device you won't miss will be a noisy fan — the SGS-17C has no fan, thus making it really attractive for quiet office settings.

Networking is supported through both AUI and BNC connectors. An auto-sensing feature lets you connect whatever cable you have without having to dig inside the box to change jumper settings. A nine-pin serial port, supporting speeds up to 38.4 Kb/sec., can be used for terminal emulation, a SLIP line, or for a printer.

Horsepower is supplied by an AMD 29000 RISC processor running at 20MHz. Two MB of DRAM (expandable to 10 MB with readily available SIMMs) and 1 MB of video RAM is standard. Configuration settings are stored separately in 2 KB of memory. Performance is rated at 47,000 Xstones.

### Installation And Configuration

Hardware installation was a cinch. The monitor sits nicely atop the slimline base. All cables were easy to connect.

Server code and fonts can be loaded from ROM (as an option) or from a host on your network using TFTP, BOOTP or NFS. We received server/font tapes for several platforms, including HP, SCO UNIX, Sun and Digital (VAX/VMS). We did not have a ROM-based unit. An install script is included which helps you put the needed files in the correct directories on your host.

After the software is loaded on a host system, you can use the terminal's setup menus, accessed by pressing the BREAK key, to establish the correct network parameters to at least let you download the server code and fonts. The Network Menu lets you set up the needed con-

nectivity parameters.

In addition to specifying the terminal's internet address, you also need to minimally specify the network address of the host machine and the machine from which the terminal will download fonts. In our case, we downloaded both server

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## The diagnostics and statistics menu items are valuable troubleshooting tools.

code and fonts from the same host. Also required is your choice of booting — TFTP, NFS or BOOTP. We used TFTP for this review.

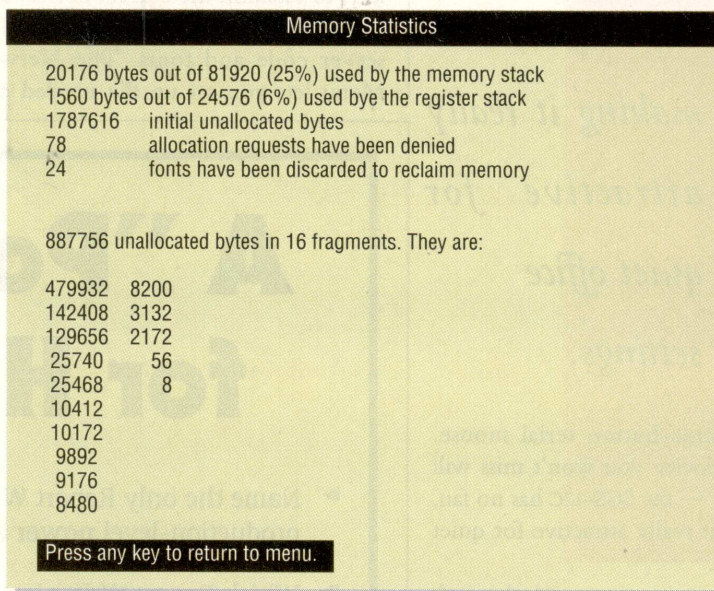
Several other parameters can be configured. For example, you can determine if the terminal will use backing store. The terminal's initial mode after booting it can be set up. We set ours up to go immediately into X mode, at different times using xdm running on our HP 9000/834 to control the display and the management mechanisms of HP VUE running on our HP 9000/360. You also can set up the terminal to present a telnet window, from which you can start X clients manually. The setup menu is also an initial boot up choice.

The diagnostics and statistics menu items are valuable troubleshooting tools. The diagnostics display lists all messages related to the terminal. For instance, you'll be able to tell if fonts got downloaded properly, or if there are any difficulties with the network connection to the terminal. The Statistics option lists a variety of information regarding network and terminal memory utilization. *Figure 1* shows memory statistics display.

A nice alternative to doing configuration directly on the terminal is sgsSetup. sgsSetup software runs on a variety of host machines and allows you to manage your X terminal farm remotely from that host. A sample sgsSetup opening screen is displayed in *Figure 2*.

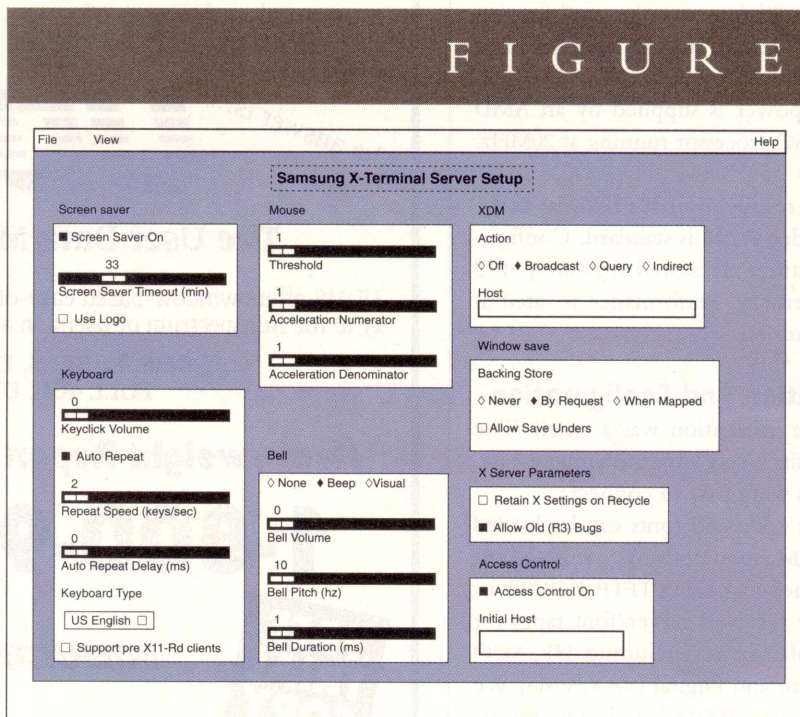
sgsSetup gives you everything that the terminal menus do, displaying separate screens that correspond to terminal menu

## FIGURE 1



Valuable data, such as this memory information, can be obtained via the Statistics option from the Top Menu.

## FIGURE 2



All of your terminals can be set up remotely from one workstation using sgsSetup.



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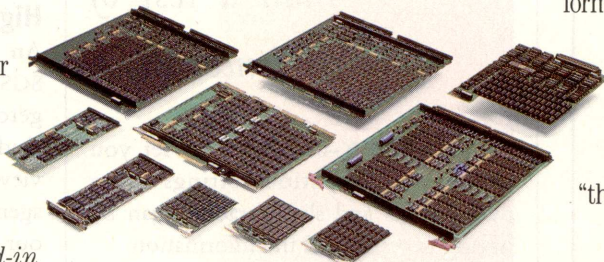
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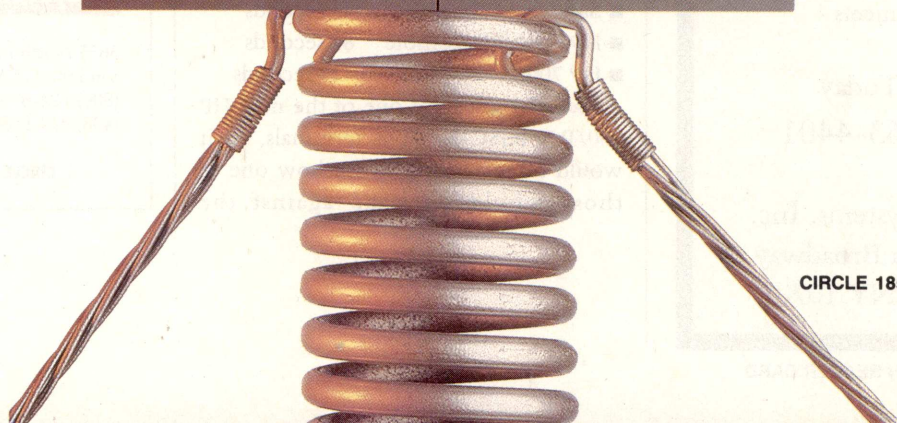
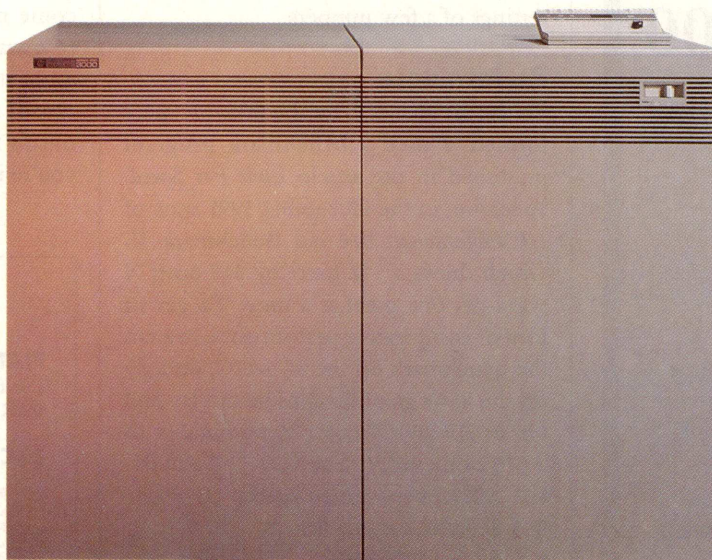
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## FROM THE LAB

**R**unning Informix Wingz was a pleasure, rather than a test of patience.

options. The X-based screens let you change configuration settings using pushbuttons and sliders rather than by having to type in all the information.

Adding memory was, literally, a snap. Extra SIMMs of either 1 MB or 4 MB can be used to expand memory up to 10 MB.

After removing the five cover screws, adding a SIMM simply meant snapping it into the easily accessible memory sockets on the system board.

Upgrading the boot or server code/font ROM looked just as easy. In the case of ROM changes, however, you also might have to check and/or change the settings of a few jumpers.

### Performance

To get an idea of how the SGS-17C performed, I used a benchmark program published in the article *Built For Speed*, appearing in the December 1991 issue of *HP Professional*. We ran Benchmark V, which draws a 512 pixel by 512 pixel X window, one pixel at a time. To get an idea of comparative performance, we ran the benchmark on the SGS-17C, directly on the 834's graphics console display and on an HP 700/X color X terminal with 2 MB of memory. The SGS-17C and the HP 700/X were served by the HP 9000/834. Results are as follows:

- Samsung SGS-17C 45 seconds
- HP 9000/834 console 89 seconds
- HP 700/X 429 seconds

We did not have one of the new HP 700/RX RISC-based X terminals, so it would be interesting to see how one of those would stack up against the

Samsung. We also ran the test on one X server at a time. We did not run the benchmark on multiple servers simultaneously.

In "real world" use, the SGS-17C's crisp performance was also felt. For example, running Informix Wingz, replete with various graphs and charts, was a pleasure, rather than a test of patience.

### Higher Level Management

An SNMP agent is included with the SGS-17C. Three SNMP applications, getone, getnext and getmany, are included with the software distribution to view the MIB-I variables defined by the agent. For example, doing a getmany on our SGS-17C yielded the values:

```
Name: sysDescr.0
Value: Samsung SGS-17c X Terminal
      SNMP Agent
Name: sysObjectID.0
Value: enterprises.236.1.1.3.2.0
Name: sysUpTime.0
Value: 1437751
```

The adequate documentation came in the form of an installation and configuration guide, a user's guide and separate release notes.

As X-Window System terminals become more prominent and the novelty of owning one wears off, users will pay more attention to price, performance and ease of use. The Samsung family of X terminals is a good place to start looking if you're in the market. ■

### SGS-17c

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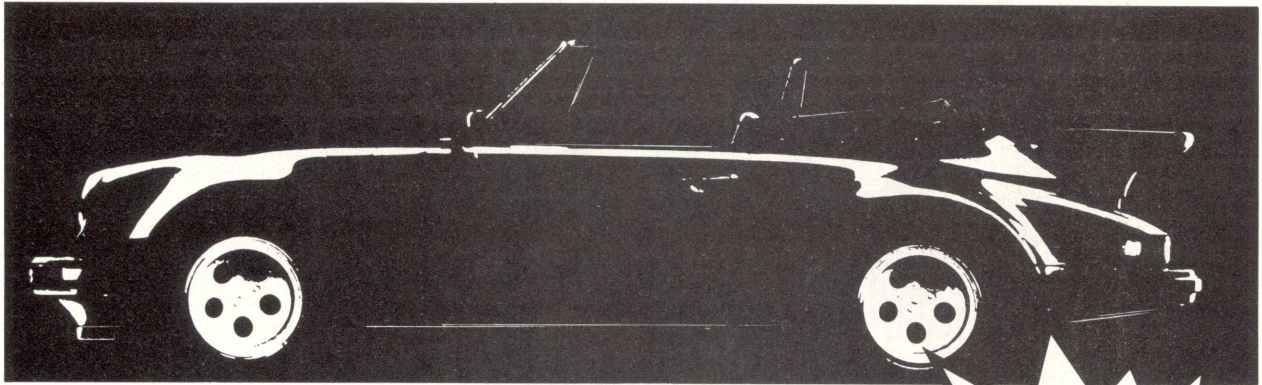
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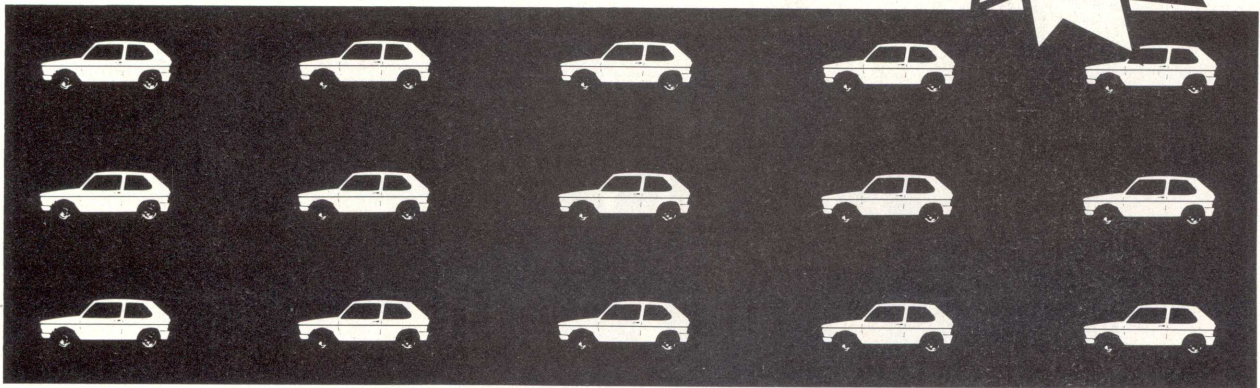


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# See \* Below

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*Desktop Publishing*

*Users*

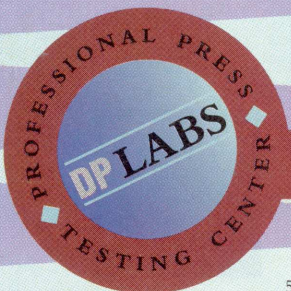
The wild card is a concept shared by all operating systems. It's the character that represents any other character or group of characters. The wild card is "expanded" or "interpreted" by the operating system to which it is handed; in its place, literally anything can appear.

A commonly used wild card is the asterisk. Whether your data processing education began with UNIX, MS/DOS, etc., you no doubt learned the significance of the asterisk early on. What's more, you also certainly learned to use the asterisk to your own advantage and convenience. Whether searching a file system, passing parameters to a program, or carrying out housekeeping on a hard

disk, all of us have had frequent occasion to be thankful for the humble asterisk.

Now, Applix Inc. (Westboro, MA) has given us another reason to celebrate the idea of an all-purpose data processing entity, with its package Aster\*x. Aster\*x is a desktop publishing application that gives you the ability to create documents, spreadsheets and graphics, to incorporate each of those types of material into the other types, to create macros whose recorded keystrokes streamline the creation of Aster\*x products, and to use other tools such as a Menu Bar Editor which enables you to create your own menu selections, and the Extension Language Facility, a programming lan-

**By Michele Petrovsky**





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guage that permits the creation of even more sophisticated macros than those offered by the Keystroke Recorder. Like its single-character namesake, Aster\*x can accurately be said to "do it all."

### Requirements And Installation

To install and run Aster\*x successfully, the application must be loaded to an HP

9000 Series 300/400, running HP-UX Release 7.0 or higher. A minimum of 8 MB memory is required; 12 MB is recommended, as is 10 MB of swap space per Aster\*x user. The basic Aster\*x installation needs about 23 MB of free disk, and space requirements may vary depending upon how many X terminals you have running. Finally, Aster\*x requires an HP

X11 windowing system running on an NCD, Visual or Micronics X terminal, and, at the other end of the I/O chain, a PostScript printer.

Now, you're ready to put your wild card into the pot. In our lab work with Aster\*x, the loading of the product began by creating an installation directory, cd'ing into that directory, and then issuing the command

```
tar xf /dev/rct/0s0 install : ./install
```

to copy the installation shellscript from the QIC format tape which was Applix's distribution medium. Then we started the install script by entering:

```
./install
```

at the HP-UX prompt. Here, the script took over, asking if we wanted to continue the load, telling us about how much time and how much disk space would be required, asking us for the name of the directory where we wanted to place Aster\*x and the name of the graphical user interface (GUI) we wanted to use in conjunction with the application, and checking on the distribution medium. It then simply hummed away for the better part of 30 minutes, after which it notified us that the installation was complete.

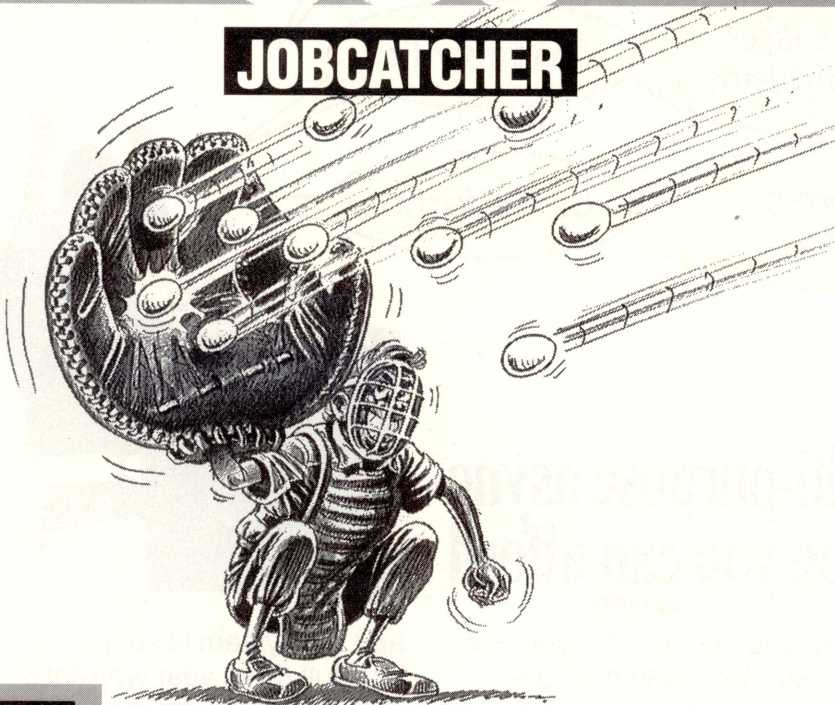
The final step in getting Aster\*x up and running is the assigning of licenses to the package, or more correctly, to each of its components. Each is precise — there are no wild cards here. License numbers must be assigned to every component of Aster\*x, through one of the application's Utilities called the License Generator.

Using this dialog box, we were provided with the unique machine ID number of our Apollo. We then had to forward this information to Applix by phone, along with the number of licenses we wanted for every Aster\*x component we planned to run.

We assume that Applix's rationale in creating such a licensing procedure was to provide administrative and security controls for its product. However, by the

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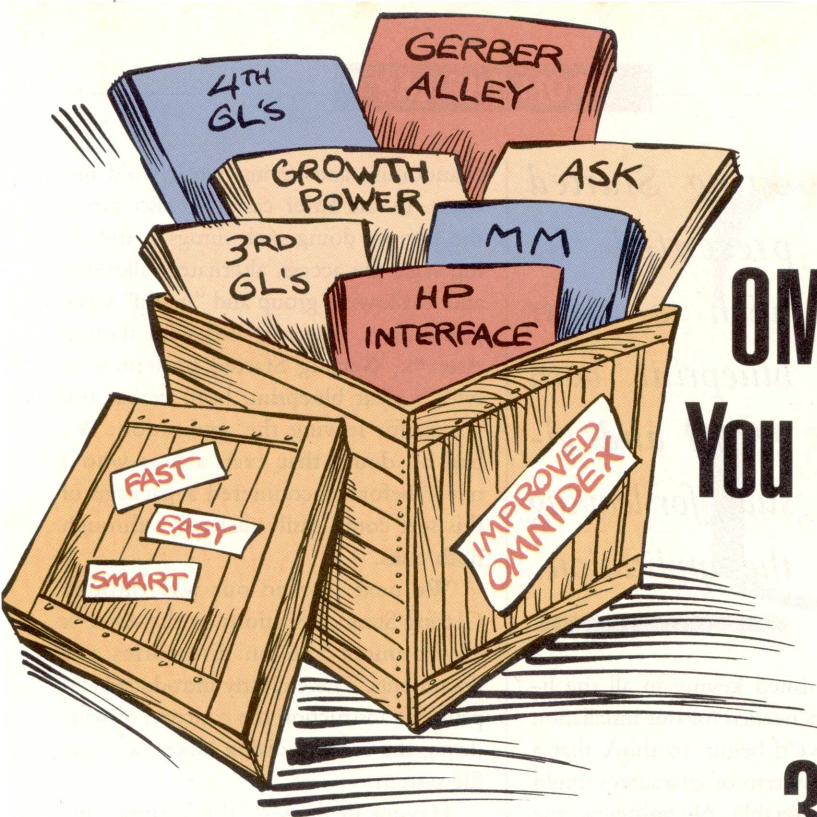
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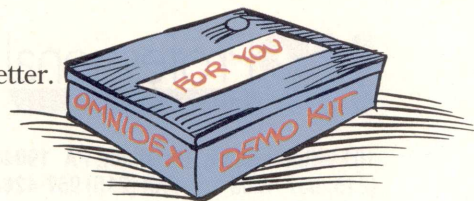
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## FROM THE LAB

*Getting Started presented us with a clear blueprint, both verbal and visual, for leaving the application.*

time we'd finished keying in all the license numbers needed for our installation of Aster\*x, we'd begun to think that a less extensive system of guarantees might have been preferable. Nevertheless, the installation of Aster\*x had proceeded smoothly and quickly.

### Tests

Even though we'd worked with a number of similar applications in the past, we decided to approach our lab work with Aster\*x as if it were the first desktop publisher we'd ever encountered. With no prior preparation or study, we picked up Applix's "Getting Started" guide for the package and dove in. We began Aster\*x in two ways: from its Main Menu, and from the command line with parameters that permitted us to immediately access a particular part of the package. For instance, we moved into Aster\*x's Graphics component both by highlighting and clicking on the appropriate part of its Main Menu, and by issuing at the HP-UX prompt the command string **asterx -gr**. Similarly, we started up Aster\*x with a particular document already fed to its "Words" module by carrying out the command **aster\*x /etc/passwd**; entering this string allowed us to edit our Apollo's password file in a much more visually interesting way than had ever been provided by vi.

Exiting an Aster\*x application window was the next feature with which we played. We left the package while both

abandoning and saving work we'd just done. In the latter case, we also varied the save by doing such things as tinkering with file access, alternately allowing and disallowing group and "world" write permissions. Just as it had with starting Aster\*x, Getting Started presented us with a clear blueprint, both verbal and visual, for leaving the application. We had no doubt that even a user who'd never before encountered a package of this sort could easily maneuver through both tasks.

We next worked our way through Getting Started's sections on the Aster\*x environment and on directories and documents. These clearly introduced and provided instruction the concepts of windows, the mouse, dialog boxes, and the file system.

Having dealt with the general, we moved on to work with specific parts of Aster\*x. We began with Words, the application's full-featured word processor and text formatter. We created new documents and retrieved existing ones. We inserted text; selected text for moving, copying and deleting; performed all those operations on the selected text; moved and copied material from other Aster\*x modules (Spreadsheets and Graphics) into the Words document with which we were working; and altered and restored default line and paragraph spacing, as well as type faces and sizes. In the last case, we found the WYSIWG display of typeface very helpful.

Next we went to work with Aster\*x's Graphics module. We simply brought up the Graphics component and began playing with the shapes and detailing it offers. While the extent of Aster\*x's graphics library was less than that of some other of the publishing packages we'd encountered, it was more than adequate to creating illustrations of a number of kinds. We "drew" circles, ovals, parallelograms and simple lines. We shaded our 2-D creations with several backgrounds. We moved and resized our shapes, and we even moved and copied them within the document with which we were working as well as to outside



A word cloud featuring the phrase "MASTER CLUSTERING" repeated multiple times in various colors (yellow, blue, green, purple, red) and orientations (horizontal, vertical, diagonal) against a dark, textured background. The words are of different sizes, with "MASTER CLUSTERING" being the largest and most prominent.

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files. We encountered no problem or discrepancy in our work with Aster\*x's Graphics component. Like everything else, the Aster\*x documentation suggested a clear and practical approach to a function, which was then carried out without difficulty.

The final item in our lab work with Aster\*x dealt with the package's Spreadsheet module. Clicking on the Spreadsheets icon in the main Aster\*x menu, we were presented with a new, blank spreadsheet. We immediately began entering data into that sheet, moving from cell to cell by means of mouse, arrow keys, and the Find item of the Spreadsheet Window menu. We entered textual labels as well as homegrown formulas (such as +B2\*C2) and a few of Aster\*x's built-in functions (among them INT, which truncates the value of the argument supplied to it to an integer number) into various cells, all of which, whether data, formula, or function, then performed just as expected.

We were unable to test some of the more esoteric portions of Aster\*x, such as the Keystroke Recorder and the Extension Language Facility. But the tests we had run convinced us not only of the functionality of the application, but of its being a package that can readily be incorporated into any environment. Aster\*x's documentation is clear and jargon-free; any user, no matter how little acquainted you are with word processing, graphics, or spreadsheets, could turn that documentation into an expertise in such applications in no time. ■

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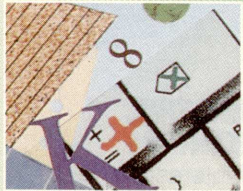
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## NETWORKING

Tim Cahoon

Recent Developments Will Lead To Many Changes This Year ...

# Looking Ahead & Behind

It's no secret that networking technology has garnered

more attention in the past two years than ever before, and it may behoove us to recap some of the more recent developments, the proverbial state of the art and future directions.

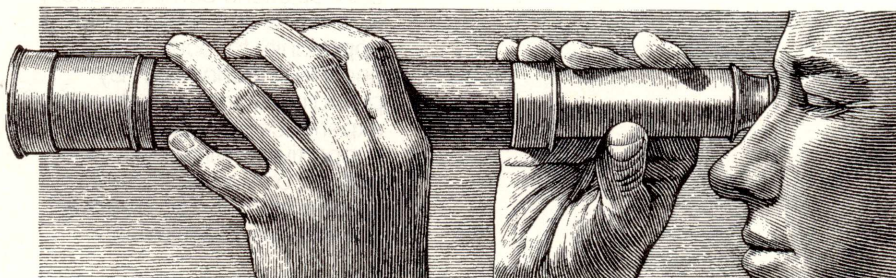
Frame Relay, SONET, ATM, ISDN, Fast Packet and SMDS are a few networking buzzwords that recently have gained prominence within the DP community. All the large public networks have announced and are installing equipment to support one or more of these emerging standards and technologies. Look for all the major long distance carriers and regional phone companies to support at least some of these technologies in the near future.

Because these new technologies are used in high-bandwidth environments, pricing for the common lease line (56k and lower) already has begun to drop tremendously. This is partially caused by the change from analog to digital switching gear. The rest is marketing. To give you an idea of how the pricing has changed, since January 1991, 56k digital lease lines have dropped in price from about \$1,000 to \$700 per month.

Public networks also are beginning to adjust their pricing as customers move to new technologies. To attract new subscribers and maintain their user base, these vendors are reaching out to attract those customers who previously viewed public networks as too expensive.

## Hardware Changes

Networking hardware vendors also are buffeted by the winds of change. X.25 equipment and modems now are em-



ploying state-of-the-art technologies that have resulted in dramatic price declines. For example, a \$10,000 X.25 switch purchased a few years ago now sells for less than \$5,000. And the new switches aren't only less expensive, they boast higher performance and greater expandability than the older models. The new modems also are less expensive and many feature network monitoring and control functions as standard options.

## HP 3000 & 9000 Networking

Our venerable HP 3000 now is talking to more systems than ever — first to other HP 3000s, then to IBM systems. Portable NetWare gave us Novell access, and an NFS for the HP 3000 put us into the UNIX world. HP has announced Token Ring support, allowing all HP PA-RISC systems to be fully integrated into Token Ring networks. X.25 has been enhanced with an outbound PAD product that allows networked HP 9000 users to transparently share a common communications server.

The HP OpenView DTC also has undergone many changes. Today, the DTC services both the HP 3000 and HP 9000 line, with TCP/IP and X.25 communications options rounding out the product line. No longer limited to being a device on a LAN, a DTC can be used and managed across a WAN as well.

HP OpenView is gaining acceptance as other companies, even IBM, are licensing parts to use in their own network

management software. Some of the technology behind HP OpenView is even serving as the foundation for several emerging OSF standards.

## Then There's IBM ...

IBM is undergoing massive changes to gain a more competitive edge over companies like Hewlett-Packard. IBM essentially has begun to break itself down into separate entities, each in charge of its destiny, each responsible to turn a profit however they see fit. It's probable that by the end of 1992 we'll see IBM-designed and manufactured components inside other vendor's products. You also may see hardware vendors using IBM factories (with excess capacity) to produce their products. Imagine the competition in the marketplace when the divisions producing the RS/6000 and the AS/400 are set free. It certainly could make for an interesting year.

One factor in IBM's decision to restructure may have been the increasing competition from HP. Starting in January 1991, HP began competing against IBM in shops that traditionally bought only Big Blue. Not only does HP have a good story to tell these organizations, but they are winning a substantial number of deals.

## Standards Du Jour

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Considerable efforts have and are being made to standardize everything that users have demanded for years. OSF's formal release of the DCE and DCM specifications should make our lives easier as products start to roll out into the market.

Standards bodies such as ACE, OSF, UNIX International, and POSIX had a busy year in 1991, with a number of standards announced and/or released. But while many of these standards may help a few ambitious, standards-oriented shops in the short run, their ultimate success hinges on vendor compliance, the release of supporting products, and customer acceptance and adaptation. Now it appears that ACE is in trouble, and HP has spawned the newest consortium block — PRO.

Meanwhile, Novell has cemented its lead as the No. 1 PC LAN provider. Banyan is still alive and swinging on Vines. The fate of LAN Manager, however, has yet to be decided. Even with Microsoft's considerable resources, it seems doubtful that LAN Manager can make a successful comeback. With Novell's commanding presence, companies such as HP have moved quickly to meet customers needs. LAN Manager is no longer the preferred solution.

While Novell is working hard to integrate all your systems across the LAN, that same integration across a WAN remains difficult. Today, such integration requires the expense of high-speed (T1 or better) lease lines and specialized hardware.

### Future Expectations

Frame Relay will grow like wildfire as the public networks finish installing their equipment and the industry agrees on a common pricing structure. Rather than billing on packets like X.25, Frame Relay bills on both bandwidth availability and bandwidth usage. Vendors are attempting to determine how much customers are willing to pay, while at the same time trying to remain competitive. Look for some major price changes as the

vendor fight for market share escalates.

I also foresee a push by end users for a change in the Frame Relay standard. The standard currently specifies that Frame Relay only is to be used to feed higher-speed networks that handle all the switching and major data movement. Users will want it to replace their internal X.25 nets and gain the benefits of Frame Relay's lower overhead.

Gradually, we will see a number of users throwing away modems and starting to use radio waves to communicate across a metropolitan area. When the HP CEs got their PC systems with modems, everyone thought that was hot stuff. For years, however, IBM CEs have been using small PCs that communicate via radio waves. These compact systems send and receive data from local radio towers as if directly connected to a host. The party who worked with IBM on the project should be bringing the product to market in 1992 if they haven't done so already. This system could prove to be extremely appealing to cellular phone companies.

If you live in a large metropolitan area, expect the local phone company to install a metropolitan fiber optic network. This network will be the backbone for communications within your area. High bandwidth and low cost will make it a very cost-effective solution.

Increasingly, this year's networking products will be based on newly released standards. However, expect the software vendors to concentrate less on interoperability and more on tools to more effectively manage system administration functions. The fall Interop convention in San Francisco should be the first place where we see some tools made available to manage and monitor a multivendor network. — *Tim Cahoon provides wide area network and HP technical support for the manufacturing operations of a Fortune 500 company.*

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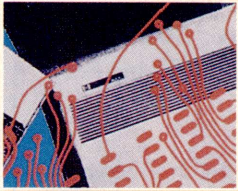
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## MANAGING YOUR HP 3000

John P. Burke

and developers were presented with a new (and expensive) way to access low-level operating system structures: the Architected Interface Facility (AIF). It's fair to say that it was a shock to some old-timers who were used to doing a fair amount of MPE hacking. With a System Tables manual and the System Programming Language (SPL) compiler, there was no limit to the amount of good fortune (or trouble) you could create.

### First, Study The Past

If you purchased an HP 3000 in the '70s, you probably remember discovering that your system included (i.e., without extra charge) the compiler for a funky, ALGOL-like language called SPL. EDITOR, FCOPY, all the language compilers, IMAGE and even MPE itself were written in SPL.

People started programming things in SPL not easily done with standard languages or utilities: calling system intrinsics from COBOL programs, programmatically retrieving PARM or using nobuff I/O to speed sequential file processing.

Functions we now take for granted, such as the CONSOLE command, did not even exist until the early '80s.

How did we survive? We all developed a bag of tricks and eagerly traded information at user group meetings and in publications.

So why did HP initially give away SPL and make internals information so easily available? First, keep in mind that HP was, and to a certain extent still is, a hardware company. It never really has warmed up to software and has only recently (and to our lasting detriment as

When MPE/XL (now MPE/iX) was introduced, users

customers) seen the revenue potential of software. Second, and most important, HP wanted to encourage people to write for the HP 3000. This is why IMAGE was part of MPE, why the System Tables manual was available at a nominal cost and why you could even purchase the source code for MPE.

### Why The AIF?

Privilege Mode (PM) access in MPE always has been a double edged sword. With PM capability in MPE, you can access and modify any of the operating system's internal data structures. While it allows for tremendous flexibility in tailoring software and managing your system, PM also can create security and system availability problems. Who among us has never crashed an MPE system?

According to John Goulden, a product manager at Hewlett-Packard, many large customers were concerned that PM compromised high-availability, mission critical applications. They wanted a more secure, supported way to access low-level operating system structures, both for themselves and for the ISVs that supplied the software they used.

HP's solution for MPE/iX was the Architected Interface Facility (AIF). AIFs

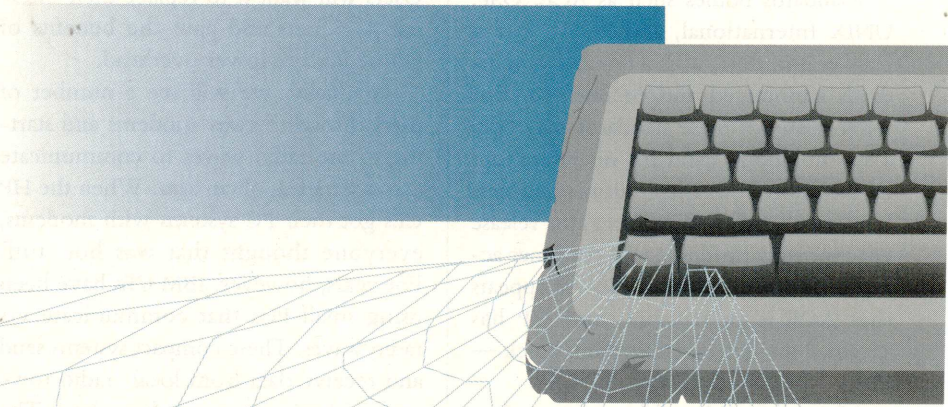
execute at user privilege mode on MPE/iX and are callable from HP Pascal/iX and HP C/iX. AIFs provide high performance, low level, high reliability, supported access to system data structures. AIFs are supposed to eliminate the need to rely on undocumented, unsupported internal procedures.

### What Is The AIF?

The AIFs provide a means for enforcing in MPE/iX the "Do not use privilege mode" dictum of MPE. There are currently three MPE/iX Architected Interface Facility products:

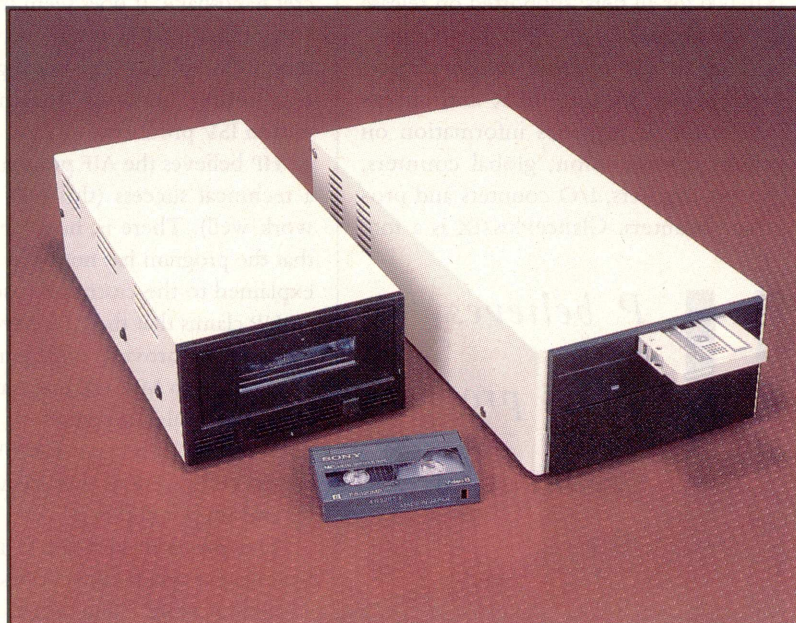
■ AIF: Operating System (36374A) (\$2,500 for all tiers; supported on release 2.1 and above)

The operating system AIF provides access (read/write) to MPE/iX internal table information without having to worry about where the data resides and whether the location has changed with the latest OS release. Examples include session and process information. This AIF also allows the developer to share data between multiple processes, use ports for fast IPC, change the logon environment of a process and save files across accounts.





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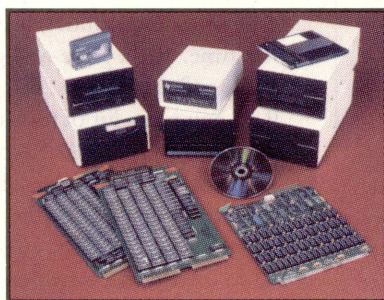
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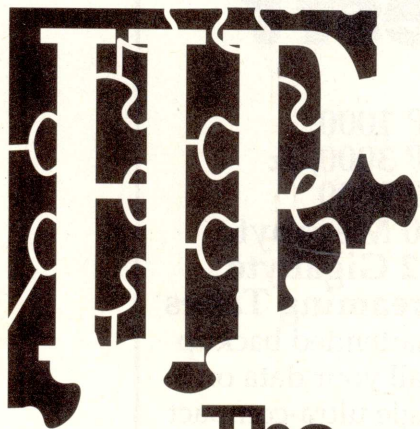
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■ AIF: Measurement Interface (36392A) (\$10,000 for all tiers; supported on release 2.2 and above)

The MI AIF is useful for developing performance measurement and charge back tools. It provides information on system configuration, global counters, process counters, I/O counters and processor counters. GlancePlus/iX is a tool

*P believes the  
AIF program  
has been a technical success (the  
AIFs work and  
work well).*

that organizes and displays information gathered by the MI AIF.

■ AIF: Procedure Exits (36429A) (\$10,000 for all tiers; supported on release 3.0 and above)

The Procedure Exits AIF allows you to intercept and replace or augment with a user-written handler procedure any operating system or user target procedure. The intercept mechanism can be dynamically armed and disarmed. The handler procedure can execute before, in place of, or after the target procedure. Multiple handler procedures can be bound to one target procedure, allowing multiple applications using the Procedure Exits AIF to co-exist. This is an incredibly powerful capability with no real analog in Classic MPE.

### How Does The AIF Work?

Incredibly, all you get for your \$2,500 or \$10,000 is documentation and training materials. Seems like everything is right there in MPE/iX, you just need to know how to use it. I suppose the idea is that if you've paid such a stiff fee to join the

club, you aren't likely to divulge its secret handshake. It does seem strange until you realize that it is the only effective way to avoid the logistics nightmare of conflicting versions floating around within ISV products.

HP believes the AIF program has been a technical success (the AIFs work and work well). There is, however, concern that the program has not been adequately explained to the customer base.

HP claims that the AIFs have been engineered to provide high performance, open access to MPE/iX internal functionality and table information. The AIFs demonstrate its support for ISV products and its commitment to software reliability and supportability.

The problem as I see it is that enhancements will be slow at best and non-existent at worst. The worst case comes into play if you aren't a high profile ISV and your requested enhancement has minimal use outside your application.

### Developers Are Made, Not Born

The HP marketing literature says the AIFs are aimed at ISVs and tool developers. Conspicuously absent is any mention of their use by end-user customers.

Did you ever wonder where ISVs and tool developers come from? "Hacker" has become a pejorative word these days. In truth, all software developers (particularly of tools and utilities) were hackers at one time. If they are any good, they probably still are hackers.

Run down the list of tool/utility vendors exhibiting at INTEREX conferences or advertising in this magazine. You'll find that, in many cases, the developers were originally end-users, end-users with access to internals information on the HP 3000.

ISVs and tool/utility developers serve an important function. Remember, HP is almost never first to market with tools or utilities. Consider these categories:

- IMAGE tools.
- High performance editors.
- Security systems.
- Performance tools.



- High performance backup.
- Report writers.

Where would we be without the ISVs and tool developers? We would probably be using some other computer system because the HP 3000 would not have developed the critical mass of users necessary to make it a continuing, profitable business for Hewlett-Packard.

And where are the new ISVs and tool developers going to come from? Certainly not from end-user sites any more. How many sites do you know of that are going to pay \$10,000 for the Procedure Exits AIF license or even \$2,500 for the Operating System AIF license so their programmers can hack around? I suspect the list will be very short.

A cynic might suggest that this is HP's attempt to protect the crown jewels and ensure that a significant share of future tool and utility revenue will be flowing out to Cupertino. While attributing AIFs to a Machiavellian plot might be a bit far

fetched, certainly the distribution scheme favors Hewlett-Packard and the existing ISVs and tool developers.

### A Modest Proposal

Providing controlled, well-defined, secure access to system internals is a desirable function within MPE/iX. This is particularly true with high availability, mission critical applications increasingly appearing on the HP 3000.

The Architected Interface Facility fulfills this function. I accept the need even if I might wish for a return to a simpler time. But make no mistake about it — flexibility and responsiveness to changing conditions and requirements are being sacrificed by the move to HP's Architected Interfaces.

Given the need for something like the AIF, how can it be made to work best for everyone?

Easy. Make the AIFs available in the same way that the System Intrinsic are

available. If HP wants to charge a nominal fee to cover the cost of the documentation, fine.

Nothing is gained by making the AIF a private club with a high initiation fee. Much is lost.

The revenue stream the AIFs generate is minimal. It's just a way to control access. And, ultimately, stifle new development.

Whether the HP 3000 and MPE will ultimately survive into the 21st century is still the subject of debate. Many analysts give only OS/400 and VMS a chance among proprietary midrange operating systems. If new development on the HP 3000 is restricted, they are likely to be correct. — *John P. Burke is the system manager for Construction Computer Center, Conshohocken, PA.*

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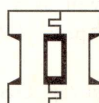
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## HP C++ 3.0 Aids Application Developers

HP introduced HP C++ 3.0, an object-oriented programming language for application developers working on HP Apollo 9000 workstations and HP 9000 business systems and servers.

HP C++ 3.0 users can take advantage of the first full implementation of UNIX Systems Laboratories Inc.'s templates feature. This feature allows you to reuse existing software, write less new code and reduce the margin for error.

Exception handling helps programmers by establishing in advance how to handle errors that arise. In an application written with exception handling, program control is transferred automatically to alternate channels when an unforeseen error occurs. The program completes its function instead of coming to a complete halt.

HP's implementation of exception handling conforms to the ANSI\* C++ committee's definition. In addition, HP C++ 3.0 includes extensions to support object-oriented debugging in C++.

## SUPERDEX 3.1 Includes Enhanced Indexing Ability

Bradmark Technologies released SUPERDEX 3.1, the fully compatible indexing package that adds data retrieval, speed and flexibility to IMAGE, TurboIMAGE and TurboIMAGE/XL databases.

Version 3.1 provides new programming options to expand IMAGE's environment with enhanced indexing capabilities including a new starting position for SUPERDEX Paths. The starting position now can be something other than the first position of an item. Path legends now can be entered in bytes in addition to words via SUPERDEX's new Byte Lengths. SUPERDEX also incorporates a new boolean operator format using AND, OR and NOT in an argument value while performing relational access as well as new wild card options.

Superdex also introduced the feature, SuperSELECT, which front-ends existing programs that execute serial reads. It will force serial reads to be replaced with a directed SUPERDEX read.

Contact Bradmark Technologies, Inc., 4265 San Felipe, Suite 800, Houston, TX 77027; (800) 275-2723 or (713) 621-2808.

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## Unison Enhances Electronic Forms Application

Unison Software released Lasersoft Version A.03 with enhancements including a new PC Design Option and a new Multipart Forms Module.

Lasersoft is an application that creates electronic forms and customized data processing reports on the HP 3000 for laser printers.

Lasersoft's PC Design Option allows you to design electronic forms on a PC with a WYSIWYG drawing program, upload the forms to the HP 3000 and then print the form with merged data on an HP LaserJet or compatible, including the recently introduced Model F100. PC Design provides the facility to take forms designed with Microsoft Windows-based programs.

The Multipart Forms Module assists in the implementation and distribution of multiple part forms. The program maps data files to a set of forms and distributes the fonts and forms to various laser printer devices. The output is distributed directly to the departments needing the data.

Contact Unison Software, 675 Almanor Ave., Sunnyvale, CA 94086; (408) 245-3000.

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## Helios Adds Memory For HP Apollo 9000, DN 5500

Helios Systems announced add-on memory kits for four models of HP Apollo's 9000 series workstations as well as a 16 MB memory board for HP Apollo DN 5500 workstation.

For models 720, 730 and 750, Helios now

has expandable 16 MB and 32 MB memory kits, each of which consists of two boards, that will expand memory capacity to 64 MB in the 720 and 730 models and 192 MB in the 750. Prices are \$3,295 for the 16 MB kit and \$6,610 for its 32 MB counterpart.

For model 425e workstations, Helios announced 4-, 8- and 16-MB memory kits each of which consists of two boards that when mixed can expand memory capacity to 48 MB. Price is \$710 for 4 MB, \$1,450 for 8 MB and \$2,400 for 16 MB.

For the HP Apollo DN 5500 workstation, Helios now has available a 16 MB memory board, four of which brings the workstation up to its maximum capacity of 64 MB. Price is \$2,850.

Contact Helios Systems, 1996 Lundy Ave., San Jose, CA 95131; (408) 432-0292 or (800) 366-0283

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## DB-LITE Eases Data Compression For 3000 Users

Proactive Systems announced a new release of the DB-LITE software. DB-LITE provides data compression for HP 3000 users, to meet application requirements such as the storage of a large volume of data online.

The new release now provides completely transparent update access to compressed IMAGE databases. You can therefore turn your normal application programs or reporting utilities against the compressed data without any program changes.

Contact Proactive Systems, Four Main St., Los Altos, CA 94022; (415) 949-9100.

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## Cognos Releases Client-Server Version Of 4GL

Cognos shipped PowerHouse Windows, a new client-server version of its fourth-generation language, initially on HP's 3000 systems running MPE/iX. PowerHouse Windows is the first Microsoft Windows based client-server tool to provide full read-write capabilities to HP ALLBASE/SQL, HP



TurboIMAGE, HP KSAM and HP MPE file and data management systems.

Powerhouse Windows allows customers to take advantage of client-server technology while protecting their existing investments in applications, data and hardware. PowerHouse is compatible with earlier releases of the 4GL, it supports a wide range of HP file and data management systems as well as Borland's Interbase advanced RDBMS and supports both character-based terminals and PCs under Microsoft Windows 3.0.

PowerHouse 4GL runs on HP 3000 and 9000 Series 800 business systems and servers, and HP Apollo 9000 Series 700.  
Contact Cognos, 67 S. Bedford St., Burlington, MA 01803; (617) 229-6600.

**Circle 397 on reader card**

### SheetMate Provides Bridge Between HP 3000s And PCs

Hillary Software announced version 5.0 of Sheetmate, which allows programmers and system managers to be responsive to users requests for HP 3000 data in formats including Lotus 1-2-3, dBase, WordPerfect, Excel and QuattroPro.

The new 5.0 release teams up with emulators such as Reflection, AdvanceLink, MS-92 and Business Session to provide end users direct PC access to HP 3000 spoolfiles, MPE files, IMAGE databases and printed reports.

Price ranges from \$1,495 to \$3,995 on a CPU license basis.

Contact Hillary Software, 309 Morris Ave., Spring Lake, NJ 07762; (908) 974-8484 or (800) 445-5279.

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### PWM Announces UX-EDIT/1000 For 1000/9000 Users

Paul W. Miller Inc. announced UX-EDIT/1000, an implementation of HP's Edit/1000 for HP 9000 UNIX users and is also fully compatible with PC-EDIT/1000. It is designed for users of the HP 1000 and 9000 systems.

UX-EDIT/1000 provides features such as screen and line modes, interactive and batch, character string search and replacement commands including regular expressions are all available. The command stack window gives you access to the last 20 commands and is accessible in both screen and line modes.

The UNDO command reverses the last line more command executed. Single line mode commands can be executed in screen mode using the CTRL C command.

New features include left and right scrolling in screen mode, automatic screen and line mode tab compensation, automatic

backup of the original file and screen mode brackets that cannot be overwritten. The initialization file is executed automatically everytime UX-EDIT/1000 is run making it easy to configure your own command defaults.

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Intelligent Data PBXs provide reliable solutions for secure connectivity between multivendor host computers, terminals, PCs and peripherals. Call (800) 328-2729 or circle 115.

## HERSTAL AUTOMATION LTD.

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## HI-COMP AMERICA INC.

Backup for MPE V, MPE XL and HP-UX. High-speed execution, high-density data compression, unattended disk to disk operation and IMAGE database management. Call (800) 323-8863 or circle 120.

## IEM INC.

Affordable hardware solutions, from memory boards and interface cards to the latest in optical disk technology. Call (303) 223-6071, (800) 321-4671 or circle 122.

## INFOTEK SYSTEMS

Leading manufacturer of high-performance HP enhancements including memory, BASIC compilers, data acquisition boards and digital signal processors. Call (800) 227-0218; in CA (800) 523-1682 or circle 181.

## INTELLIGENT INTERFACES

Plotter/printer buffers, data loggers for HP-IB, IBM PC compatibles, memory expansions for HP computers: Converters for HP-IB/Centronics peripherals. Call (800) 842-0888 or circle 126.

## INTERACTIVE SOFTWARE SYSTEMS

UDMS™ - User Data Management System. The ease-of-use, connectivity and functionality leader for ReportWriting and 4GL data management of all major HP-UX, HP-MPE/iX and DEC-VMS databases. Call (800) 944-UDMS or (303) 987-1001 for a free demo or circle 214.\*

## ISA CO. LTD. / TEXAS ISA INC.

Complete range of mass storage devices and other peripherals for HP 3000, 1000 and 9000 from ISA. Call 81-3-(5261) 1160, FAX 81-3-(5261) 1165 or circle 245.

## KELLY COMPUTER SYSTEMS

Manufacturer of performance products: RAMDISC, Spectrum memory, Classic memory, and PC and LaserJet memory. CPU upgrades also available. Call (415) 960-1010 or circle 185.

## KINGSTON TECHNOLOGY CORP.

Kingston Technology designs and manufactures memory upgrades for PCs, laptops, workstations and laser printers. The Kingston product line also features mass storage subsystems and processor upgrades. Call (800) 835-2545, FAX (714) 435-2699 or circle 281.

## MARTECH

Highest quality solutions at the lowest price available. Complete line of memory products for HP 9000, 3000 and 1000 computers. Also RAM for Apollo Domain Series 2500-5500. Ship from stock. Call for your pricing today! Call (800) 582-3555 or circle 220.

## M.B. FOSTER ASSOCIATES LTD.

Utility software supplier, specializing in PC/mini integration, EDI software and customer service and support. WRQ distributor. Call (800) ANSWERS or circle 155.

## MINISOFT INC.

Minisoft 92 for DOS and Windows providing HP terminal emulation and LAN connectivity for just \$129. Call (800) 682-0200 or circle 472.

## NEWPORT DIGITAL CORP.

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## NSD INC.

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## O'PIN SYSTEMS

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## OREGON DIGITAL COMPUTER PRODUCTS INC.

Distributor for the RT386SX-2 upgrade for HP Vectra ES and ES/12 personal computers. Dealer inquiries welcome. Call (800) 854-5678 or circle 489.

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## WALKER RICHER & QUINN INC.

Makers of Reflection Series Software. HP terminal emulation for PCs and Macintoshes. Call (800) 872-2829 or circle 222.

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Contact Paul W. Miller Inc., 27 Rambling Brook Dr., Holmdel, NJ 07733; (908) 946-0440.

Circle 391 on reader card

### Objectworks/Smalltalk Available On 700 Series

ParcPlace Systems announced its Objectworks/Smalltalk object-oriented development environment will be made available for the HP Apollo 9000 Series 700 workstation family.

Objectworks/Smalltalk is comprised of three components, which assist in development of client-server applications in corporate IS departments: an object-oriented language, a full suite of object-oriented tools and Portable Objects to assist in reusing and maintaining code. Objectworks/Smalltalk provides class libraries for development highly-interactive graphical applications, with more than 7,400 reusable methods and more than 350 types of Portable Objects.

Applications developed on Objectworks/Smalltalk run unchanged on all support platforms using their native graphical user interfaces, including IBM RS/6000, DECstations and the HP 9000 Series 300.

Contact ParcPlace Systems, 1550 Plymouth St., Mountain View, CA 94043; (415) 691-6700.

Circle 395 on reader card

### Ptoolkit Includes Monitoring And Tuning Tools For HP-UX

Metro Information Systems announced Ptoolkit, a set of six performance monitoring and tuning tools for HP-UX platforms. These tools allow system administrators to optimize performance and regain lost systems resources.

The tool set is comprised of one program which analyses overall system performance and the five programs which graphically display use of various system resources in real time.

Ptoolkit costs \$500 for a single platform license and \$2,500 for a site licence.

Contact Metro Information Systems Corp., 2656 Flora St., Baltimore, MD 21230; (800) 484-1061.

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### ATA's ExQC Retunes Manufacturing Process

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October 23, 1991

Russell Davis  
Walker Richer & Quinn, Inc  
2815 Eastlake Avenue East  
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Dear Russell,

Here is the Software License agreement for Posthaste. Sorry it's taken so long to get it returned to you. I want to let you know how much everyone here at Channel 6 likes Posthaste. It has revolutionized this organizations communications. We are more productive but even more than that departments and individuals are sharing information and communications in ways they never did in the past. It is being credited with being the single most productive action to improve station morale in years. It makes me look like a hero (heroine), thank you.

Sincerely,

*JC Strote*  
JC Strote

CIRCLE 222 ON READER CARD



system, ExQC that allows process improvement teams to isolate, define and solve manufacturing quality problems quickly.

ExQC uses data drawn from both process and product systems to evaluate relationships among data collected from multiple sources. This perspective pinpoints areas for

investigation and focuses problem solving team efforts to retune the manufacturing process. ExQC is available for HP-UX, UNIX and DEC VMS/Ultrex.

ExQC facilitates cross-functional problem solving when studying multiple processes and their relationships. It uses statistical graphics

in a GUI-based system and supports an open-systems environment by conforming to POSIX 1003.1, TCP/IP, OSF/Motif and X Windows.

Contact ATA, 9000 Keystone Crossing, Suite 1000, Indianapolis, IN 46240; (317) 573-9000.

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## **Turbo Charged HT BASIC With New Compiler**

Workstation Source introduced the HP Basic 386 Compiler, which is the latest addition to HT BASIC, the advanced program that enables users of Hewlett-Packard 9000 Series 200/300 machines to run programs written for these computers using Rocky Mountain BASIC on any DOS based PC.

The compiler provides performance improvements and enables users to produce fast, numerically intensive subprogram without the need for additional programming. The HT Basic 386 Compiler takes BASIC subprograms and produces equivalent 386/486 machine code subprograms. The Compiler produces code to run in 32-bit protected mode.

The HT Basic 386 Compiler is \$495 and requires the DOS 386 version of HP BASIC. Contact Workstation Source, 16 Auckland Close, Maidenhead Berkshire SL6 8QB England; (0628) 75252

**Circle 392 on reader card**

## **scsiTerminal Servers Unveiled For 9000 Series 300 And 400**

Central Data Corp. announced its line of scsiTerminal Servers for the HP 9000 Series 300 and 400 workstations.

Central Data scsiTerminal Servers provide serial and parallel expansion without consuming a card slot. By plugging into the SCSI port, scsiTerminal servers provide a way for HP Apollo users to add terminals, printers, modems, plotters and other serial and parallel devices.

Contact Central Data, 1602 Newton Dr., Champaign IL 61821-1098; (217) 359-8010, (800) 482-0315.

**Circle 390 on reader card**

## **Dataram Boosts Memory For HP 9000/8x7 And 3000/9x7**

Dataram Corp. announced new memory upgrades for HP 9000 Series 8x7 and HP 3000 Series 9x7 midrange systems and business servers.



Designated the DR930, the boards come in 16 MB and 32 MB board sets that expand the HP 9000 Series 8x7 and the HP 3000 Series 9x7 to capacities ranging from 128 MB to 192 MB.

Dataram is also offering the DR930C, a 10-slot memory carrier card that can be used for adding more board sets.

The DR930/16 is \$5,600 and the DR930/32 is \$11,200. The card carrier is \$875.

Contact Dataram Corp., P.O. Box 7528, Princeton, NJ 08543-7528; (609) 799 0071.

**Circle 388 on reader card**

## Minisoft's Scout Retrieves Information From Host

MiniSoft released Scout, its latest addition to the Office Professional family of software products. Scout is a tool designed for HP 3000 users who want to retrieve information from the host computer. Scout will allow you to take information from existing HP 3000 spoolfiles, MPE files, IMAGE databases and convert to Lotus, WordPerfect or DBase file formats.

Once the file is created, Scout automatically downloads the file(s) to your PC using MiniSoft 92 or reflection terminal emulation. Scout also can be used to produce reports to be displayed or printed on any terminal or PC. Price is \$129.

Contact Minisoft Inc., 13617 State Hwy. 9, Snohomish, WA 98290; (800) 862-0200.

**Circle 387 on reader card**

## Quote Management Module Links Fastrack With OMAR

Los Altos Software announced a fully-integrated quote management module that links Fastrack 3000, its sales leads tracking and marketing information system with OMAR, ASK Computer Systems' order management/accounts receivable software.

The quote management module provides a seamless interface to the OMAR system, and maintains all quote-related information with Fastrack 3000 as a logical outgrowth of the sales process.

The quote module supports unlimited quotes per prospect, both range and discrete quote formats. The OMAR interface reduces data entry by importing selected OMAR customer information when leads are entered into Fastrack 3000. It also accesses OMAR's product, discount and pricing data for inclusion into a quote.

Contact Los Altos Software, P.O. Box 639, Los Altos, CA 94023-0639; (415) 941-6030.

**Circle 385 on reader card**

## C-Tech Ships CI-8E General Purpose Laser Printer

C-Tech Electronics Inc. announced the CI-8E 8ppm/300dpi desktop laser printer.

Used in general business office environments, the CI-8E services such day-to-day applications as word processing, envelopes and labels and presentation-ready reports. The CI-8E is HP PCL 5 compatible and emulates the Epson FX-850 and IBM Proprinter XL24e dot matrix printers. Edge Enhancement Technology (EET) eliminates jagged edges on text and graphics to create clear text and smooth lines and curves. Additional features include eight scalable and 14 bit-mapped resident fonts; 1 MB standard memory expandable to 5 MB in 1 MB and 2 MB increments; and 8-bit parallel/RS232C/RS-422A interfaces.

Contact C-Tech Electronics Inc., 2515 McCabe Way, P.O. Box 19673, Irvine, CA 92713; (714) 833-1165.

**Circle 382 on reader card**

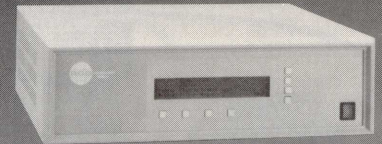
## HP Presents Postscript Level II Cartridge

HP introduced the PostScript Level 2 cartridge for HP LaserJet III, IIID and IIIP printers. The new cartridge lets you do automatic language switching from the computer, offering users fast access to PostScript and HP PCL 5, the HP LaserJet III resident language.

For most applications, the software driver included with the new PostScript cartridge lets users switch between PostScript and printer-resident HP PCL 5 either automatically from the user's computer or manually from the front panel of the printer. With the new cartridge installed, a single printer can support a number of users who may have different language needs, allowing each user to choose independently between HP PCL 5 and PostScript. When PCs and Macintosh computers use an I/O switching device to access the same HP LaserJet printer, the new cartridge allows Macintosh users to use PostScript while PC users have the option of using either language.

The HP LaserJet PostScript Cartridge Plus can be used with HP network-printer interface cards that allow users to connect their HP LaserJet III and IIID printers directly

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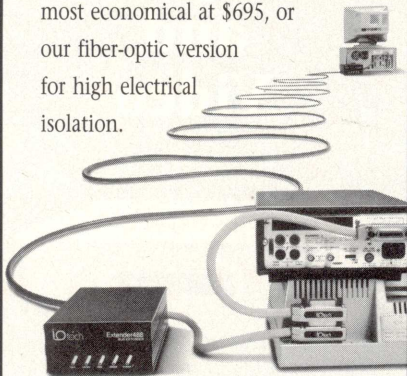
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## NEW PRODUCTS

to Ethernet or Token Ring networks running Novell Netware. The cartridge may also be used with HP LaserJet III, IIID and IIIP printers on other network systems with support from third-party utility products.

The HP LaserJet PostScript Cartridge Plus is \$695 and includes a driver for Microsoft Windows applications that takes advantage of PostScript Level 2 features.

### JetLAN Connects LaserJet To Network Running Netware

ASP Computer Products announced JetLAN, a network print server card that allows an HP LaserJet printer to be connected anywhere on a twisted pair (10BaseT) or thin-wire (10Base2, coax) Ethernet network running Netware.

JetLAN eliminates the need for an expensive print server or dedicated PC. It slides into the Optional I/O slot in the rear of an HP LaserJet II, IID, III or IIID. The JetLAN can be connected to the existing LAN cabling anywhere on an Ethernet LAN using standard network connections to plug into a network the same way you'd plug into an additional workstation.

The JetLAN supports up to 40 print queues on up to eight servers and is compatible with any Netware-supported node.

The JetLAN comes in two models the JL100 which has a BNC connection and supports thin-wire (10Base2) configurations, and the JL200 with a RJ45 connection to support twisted pair (10BaseT) configurations. Price for both is \$595.

Contact ASP, 160 San Gabriel Dr., Sunnyvale, CA 94086; (408) 746-2965.

CIRCLE 384 ON READER CARD

### Poudre's Video Capturing Enables X Window Display

Poudre Computer Co. released the VIB400 video capturing system for HP 9000 Series 400 workstation.

A successor to the VIB300, the VIB400 is a video capturing system that enables HP workstations to accept and display live video images in an X window on the computers monitor. The VIB400 is designed to take advantage of the faster monitor being shipped with the Series 400 workstations, designed with faster parts that will work with the 72 Hz vertical scan rate of HP's new monitor.

Poudre's system is an internal card that plugs directly into a DIO-II slot of the

workstation. Up to four cards can be installed at a time, enabling the independent display of four separate images.

Contact Poudre Computer, 4800 Cambridge Ave., Fort Collins, CO 80525; (303) 226-1148.

CIRCLE 383 ON READER CARD

### Abraxas Lends POSIX Validation To Developers

Abraxas Software Inc. announced a new software development system that will validate compliance to the POSIX specification.

The new CodeCheck expert system tool will validate C or C++ source code and determine if it is compliant to POSIX.1, AT&T UNIX System V, and Berkeley UNIX standards. CodeCheck reads all variants of C and C++ source code (Microsoft, Borland, Microtec, Green Hills, MetaWare, Watcom, AT&T, GNU and Zortech). CodeCheck is available on UNIX systems, priced at \$995 for a single user license. CodeCheck is also available for MS-DOS at \$495, Apple Macintosh at \$495 and IBM OS/2 at \$695.

Contact Abraxas Software Inc., 7033 SW Macadam Ave., Portland, OR 97219; (503) 244-5253.

CIRCLE 380 ON READER CARD

### JetForm Enhances LAN Based E-Mail System

JetForm Corp. announced JetForm for E-Mail, specifically designed to enable cc:Mail users to send and retrieve completed electronic forms through their existing LAN based E-mail system.

All forms required by the user can be designed using JetForm-Design. The forms themselves include fields that can be set up either for data entry by the user or by calculations based on the value of other fields on the form.

JetForm for E-Mail includes a "ribbon" feature which consists of a row of command buttons across the top of the form display window, just below the menu. The user's configuration information controls which JetForm for E-Mail commands are included as command buttons.

When sending a form via JetForm for E-Mail, users select from among three alternatives: "data only" (for a standard form that has already been distributed to all intended recipients); "data and form" (where the sender is not certain whether all recipients



## NEW PRODUCTS

have a copy of the form required to read the message): or "data and form as text message" (where the message to be sent is a regular "text only" message that can be read by any e-mail user, even if the recipient does not have JetForm for E-Mail installed on their PC).

Contact JetForm Corp., 163 Pioneer Dr., P.O. Box 606, Leominster, MA 01453; (613) 594-3026.

**Circle 379 on reader card**

### Dennis And Schwab Release Turbo Edit For MPE XL

Dennis And Schwab Inc. announced Turbo Edit, a programmer's editor making full use of the facilities available in MPE/XL (iX).

Turbo Edit's user interface is a multi-window, full screen, character mode WYSIWIG display. Keystrokes are minimized through the use of programmed function keys, special keys and a macro capability, all implemented using the typeahead facility. The eight function keys are downloaded with the most commonly used

requests; Mark, Delete to Save, Copy to Save, Insert Save, Goto, Delete, Search and Menu.

Users can open up to 20 buffers containing up to 20 source files that can be manipulated simultaneously (including Cut and Paste) with up to four windows displaying different buffers or different regions of the same buffer. Repetitive operations are enhanced through a MACRO facility. Any completed request can be repeated as a single key REPEAT LAST request. Turbo Edit performs more than 100 edit requests covering Windowing, File Related, Cursor Movements and Miscellaneous Requests including executing MPE/XL commands or interrupting to MPE/XL.

Contact Dennis and Schwab Inc., 17330 Newhope St., A, Fountain Valley, CA 92708; phone number.

**Circle 377 on reader card**

### Rosetta's New MICR Printer Features 16ppm

Rosetta Technologies Corp. added the RT3316M Continuous Laser MICR Printer

to its family of Magnetic Ink Character Recognition (MICR) laser printers.

The printer features a rated speed of 16 pages per minute, has a duty cycle of 50,000 pages per month. The RT-3316M allows users to perform continuous feed/form MICR processing with the flexibility and image quality of laser printers. It can produce checks, vouchers and loan coupons on user selected choice of blank paper stock.

The RT3316M is configured with HP Series II emulation with 2 MB of memory and dual font cartridges accommodating any HP compatible font cartridge.

Contact Rosetta Technologies Corp., 9417 Princess Palm Ave., Tampa, FL 33619; (800) 937-4224.

**Circle 378 on reader card**

### CCG Presents Plug and Play 1 GB Magneto-Optical Drive

Contemporary Cybernetics Group announced the CY-2000, a 1 GB magneto-optical disk drive that is "plug and play"

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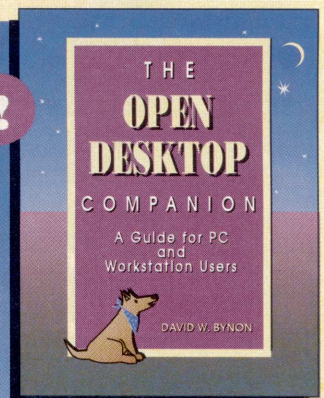
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CIRCLE 137 ON READER CARD

compatible with most personal computers, including HP, Sun, IBM and DEC.

The double-sided media, called optical platters, are erasable, rewritable and available in both plastic and glass. With dimensions and mounting provisions identical to those of standard 5 1/4-inch Winchester or floppy disk drives, the CY-2000 fits easily into most systems and provides fast access to large on-line databases and graphics files. The CY-2000 features a 35 ms average seek time and a 10 Mbits per second average transfer rate. To ensure data integrity, the drive employs both read-after-write checking and automatic ECC.

The CY-2000 is a turnkey subsystem that features the drive in a tabletop unit with controller, power supply, cabling and a 12-month warranty. With dual-drive rack mounting options and a variety of cable lengths, most site requirements can be met. Contact Contemporary Cybernetics Group, Rock Landing Corporate Center, 11846 Rock Landing, Newport News, VA 23606; (804) 873-0500.

Circle 375 on reader card

### ERDAS Available On HP Series 700 Dual CRX Workstations

ERDAS Inc. announced Workstation ERDAS Version 7.5 on HP's multimonitor configurations for its HP Apollo 9000/700 family.

The Dual CRX, available on Models 720, 730 and 750, allows the use of two to four 72 Mhz monitors with 1280 x 1024 resolution, from one keyboard or mouse. The ERDAS geoprocessing package is a fully integrated GIS that enables analysts to integrate imagery from earth-revolving satellites, aerial photographs, hardcopy maps and tabular data into a single system. The combination of the HP Dual CRX Workstation with ERDAS software offers increased image size and detail and allows users to display full-screen images on one monitor and menu windows on another, or two or more full-screen images for image-to-image registration.

Contact ERDAS, Inc., 2801 Buford Highway, Suite 300, Atlanta, GA 30329; (404) 248-9000.

Circle 374 on reader card

### RAID Box Disk Striping Stops Disk Failure Downtime

Box Hill Systems Corp. announced the RAID Box, providing protection against

potential disk faults for online disk storage.

The RAID Box incorporates a 6 GB high-speed fault-tolerant disk array utilizing "hot-pluggable" drives to eliminate computer downtime due to disk failure. The RAID Box implements Level 5 R.A.I.D. (Redundant Array Independent Disks). Using disk striping, the array reads and writes data and error correction information across five independent disk drives. If a single drive fails, enough information is available on the remaining disks to allow the data to be completely reconstructed.

Removeable drive modules in the RAID Box allow disks to be replaced while the system is up and running. If a disk drive fails, the user simply pulls out the old drive and plugs in the replacement. The RAID Box provides continuous availability of data during drive replacement and automatically rebuilds "lost" data on the replacement drive. The RAID Box is compatible with HP, Sun, IBM RS/6000, NeXT and Pyramid systems.

Contact Box Hill Systems Corp., 161 Avenue of the Americas, New York, NY 10013; (212) 989-4455.

Circle 372 on reader card

### Design/3000 Unveils Callback/3000 Phase III

Design/3000 Inc. announced Phase III of its down detector and job notification system.

The Phase III unit is designed to monitor the computer environment for system hangs, power failures, room temperature, external events and job aborts. New hardware enhancements include an UL, CSA certified ups, a 40 MB hard disk for extended message capacity, an internal modem for remote diagnostic support, a faster CPU and an optional ethernet card for monitoring critical networks.

New software enhancements include an interrupt driven callback program designed to give faster response to all events, extra voice message slots so users can create voice message files that can be compiled with alphanumeric data to form a complete information request, and call in capability to request execution of an MPE command or command file or to request that a modem port be made available. Additionally, audit trail information may be directed from the printer to a diskette file.

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**Gordon  
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# Computer Room Politics

It isn't often that we get to talk about computers and

great social issues at the same time. The current ozone depletion scare gives us just that momentous opportunity. I wish it didn't.

In February, the Bush White House announced an accelerated phaseout of CFCs (chlorinated fluorocarbons) that cause destruction of stratospheric ozone, and reduce the effectiveness of the atmosphere as a filter of harmful UV radiation. Phase-out of the production of CFCs, originally slated for the year 2000 by the 1987 "Montreal Protocol" signed by 50 industrialized nations, was instead mandated for 1995 in the U.S.

Bush succumbed to the Chicken Little syndrome in response to the famous Ozone Hole Over Kennebunkport, hypothesized by scientists who measured an increase in chlorine monoxide in the arctic polar vortex in January. Extrapolating up to a 30 percent decrease in ozone levels over Canada and the Northeastern U.S., NASA rushed its preliminary findings to a press conference, fully two months before the experimental observations were slated to end, and the Senate jumped all over the opportunity to show that its love for green extended beyond money.

Despite the preliminary nature of the findings — and some potentially bad science — Washington jumped on the environmental bandwagon with a quickness that is most uncharacteristic of the Beltway Bozos. As usual in such actions, the congressional cattle lunched on political hay and then left us to foot the bill.

The chemistry that implicates CFCs in the destruction of ozone is pretty straight-forward. Chlorine attaches itself

to one of the oxygen atoms in ozone — forming the dreaded chlorine monoxide — and kicks the other two oxygen atoms loose. Bye-bye ozone. Disagreements among scientists do exist, though, over the severity of the global ozone depletion problem. The reliability of polar ozone levels as indicators of global ozone depletion are still debatable

**For those of us who  
run computer rooms,  
the alternatives to using  
CFCs aren't very clear.**

because of the unique meteorological conditions of the poles in winter, when atmospheric vortices isolate the polar atmosphere from the rest of the globe's. The effect of natural phenomena like volcanos on ozone levels are also controversial, and we really don't understand how much ozone levels fluctuate naturally.

In environmental matters, it's probably better to be safe than sorry, but this doesn't excuse the short-sightedness of policy makers who make snap decisions. Phase-out of CFCs is a good idea, but a three-year deadline is not a phase-out, it's an ultimatum.

For many years, we've used CFCs and related compounds for everything from aerosol propellants to circuit-board cleaning, manufacturing plastic foam, air conditioning, refrigeration and fire suppression. For some of these applications, we've already found suitable substitutes and acceleration of the phase-out timetable won't cause too much of a problem. For those of us who run computer rooms, however, the alternatives to using CFCs aren't very clear. Air

conditioning and fire suppression are going to be the sticking points.

First, let's talk about air conditioning. Although technologies are emerging that can replace traditional Freon-based compressors, conversion to them is going to cost some big bucks. CFCs are useful because they are non-combustible and supply lubrication to moving compressor parts. Replacements that have been proposed include hydrogenated CFCs, but these are implicated in causing smog and exacerbating the greenhouse effect. Other gases, like helium, have been proposed for use, but all require replacement of existing equipment.

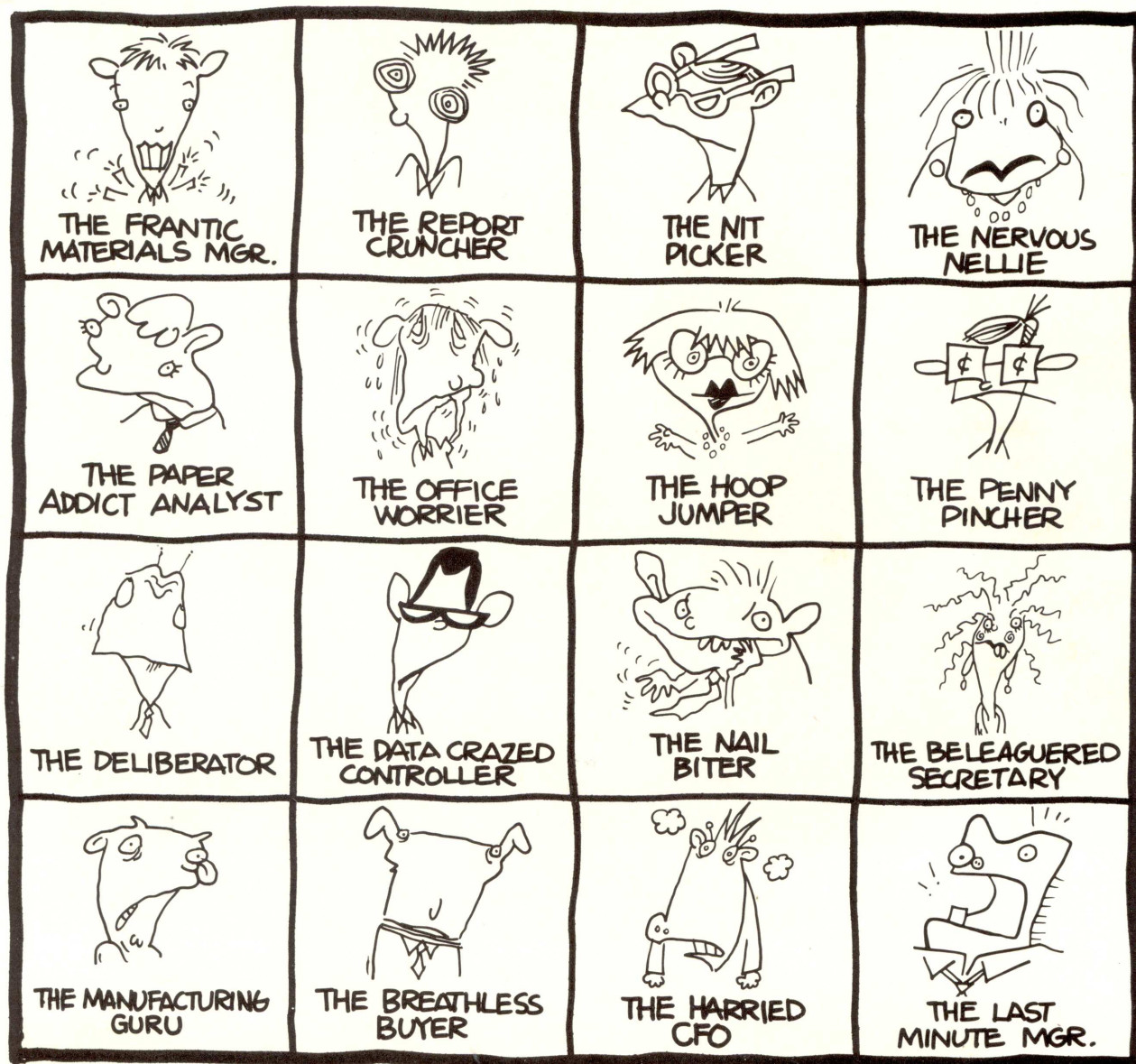
When CFCs are no longer available, it is going to be increasingly difficult to maintain existing equipment. That means replacing — instead of repairing — your air conditioner or refrigerator when it breaks. This is going to be a major expense for businesses, and I don't even want to think what it means for people on low or fixed incomes. I guess they can eat dried food and sweat.

The issue that hits closest to home is getting rid of Halon. After having my computer equipment saved by a Halon fire-suppression system, I'm really offended by the idea of falling back on less effective methods. If you've ever seen Halon put out a fire, you know that it's almost magical. Putting water on an electrical fire is stupid, and the use of carbon-dioxide gas systems is dangerous too. Accidental inhalation of Halon in fire-fighting concentrations won't kill you, carbon dioxide will.

So there we have it. In less than three years you'll get to replumb your data center, pay through the nose to do it and hope the decision doesn't kill somebody. Thanks, Washington. I hope I can repay the favor.



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